PRELIMINARY ASSESSMENT

of

GULFSTREAM AEROSPACE, CORP.

(OKD981518327)

X SA VOL 1

Prepared By

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ICF Technology, Inc.
Region VI

August 20, 1990

PRELIMINARY ASSESSMENT
of
GULFSTREAM AEROSPACE, CORP.

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FIGURES

TABLE

1. SITE INFORMATION

The Region VI Field Investigation Team (FIT) was tasked by the U.S. Environmental Protection Agency (EPA) under Technical Directive Document (TDD) F-06-9002-18 to conduct the Preliminary Assessment (PA) of Gulfstream Aerospace, Corp. (OKD981518327) in Bethany, Oklahoma County, Oklahoma.

1.1 SITE LOCATION

Gulfstream Aerospace, Corp. is located south of Wiley Post Airport on 50th Street in Bethany, Oklahoma County, Oklahoma. Although the site is on the opposite side of 50th Street, Wiley Post Airport and Gulfstream Aerospace share the same mailing address of 5001 North Rockwell, Bethany, Oklahoma 73008. The site coordinates are 95° 38′ 35" north latitude and 35° 31′ 15" west longitude (Figure 1).

1.2 SITE BACKGROUND

The site is privately owned by the Chrysler Corporation (telephone: 405/789-5000). Mr. Bill Humes is the Gulfstream Aerospace Senior Vice-President (Ref. 1). It is not known when the site began business at this location.

2. BACKGROUND AND OPERATING HISTORY

This section addresses site history and operations, known and potential problems, and regulatory involvement of federal, state or local agencies.

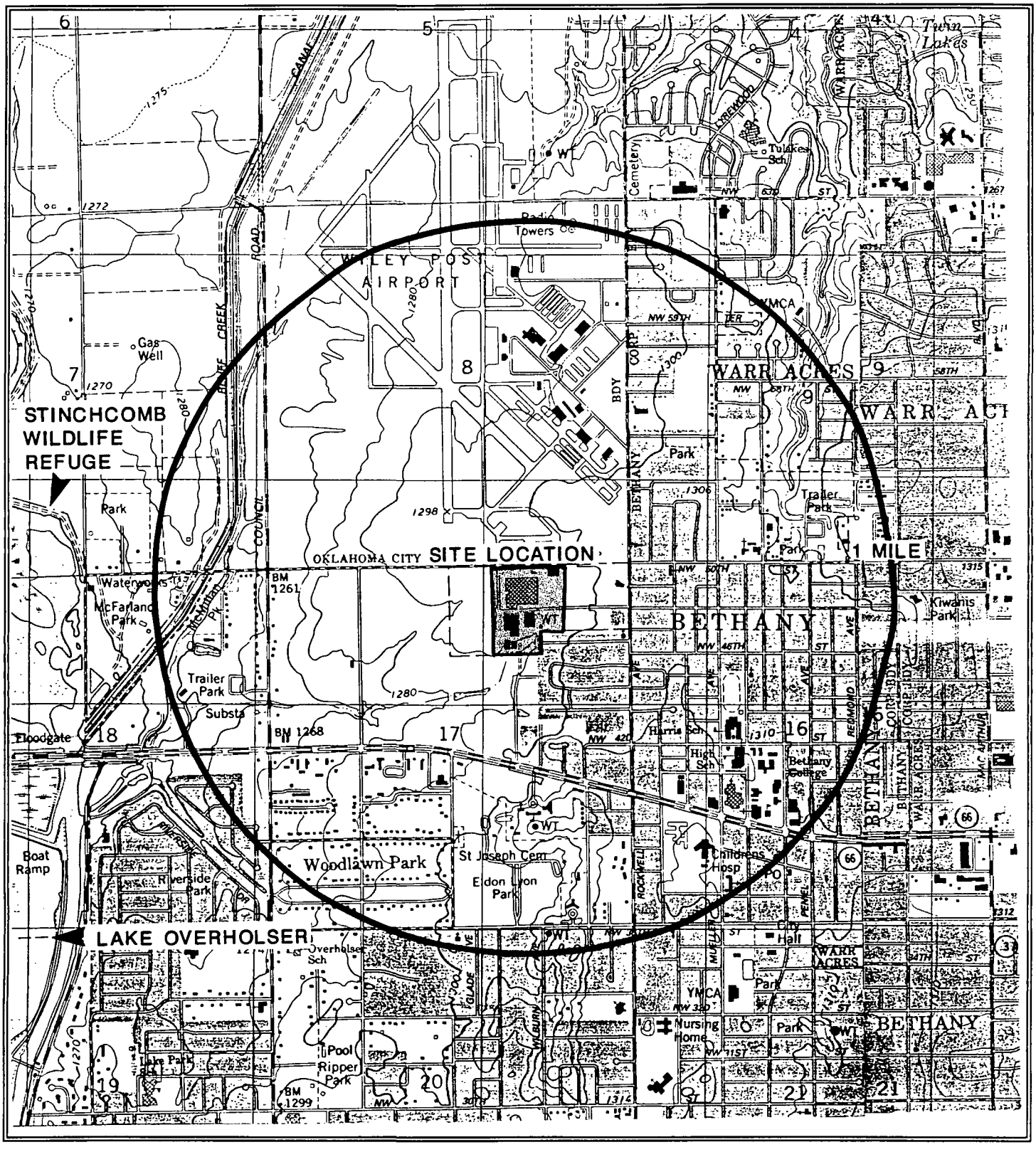
2.1 SITE HISTORY

Gulfstream Aerospace is a manufacturer of aircraft parts. A spill of hydrofluoric and chromic acid was reported on May 22, 1986. The removed soil and remaining soil were sampled. Analysis revealed that the soil was EP toxic for chromium and lead. During sampling, it was pointed out that lead contaminated foundry sand had previously been dumped on the ground (Ref. 1, p. 8). As of July 11, 1986, the facility was in the process of cleaning out old chemical products and had accumulated large amounts of wastes. The wastes were stored in 55-gallon drums in the hazardous waste storage area. The facility exceeded the 90 day holding limit before removing the labelled wastes. The drums were dated March 6, 1986 (Figure 2) (Ref. 1, p. 9).

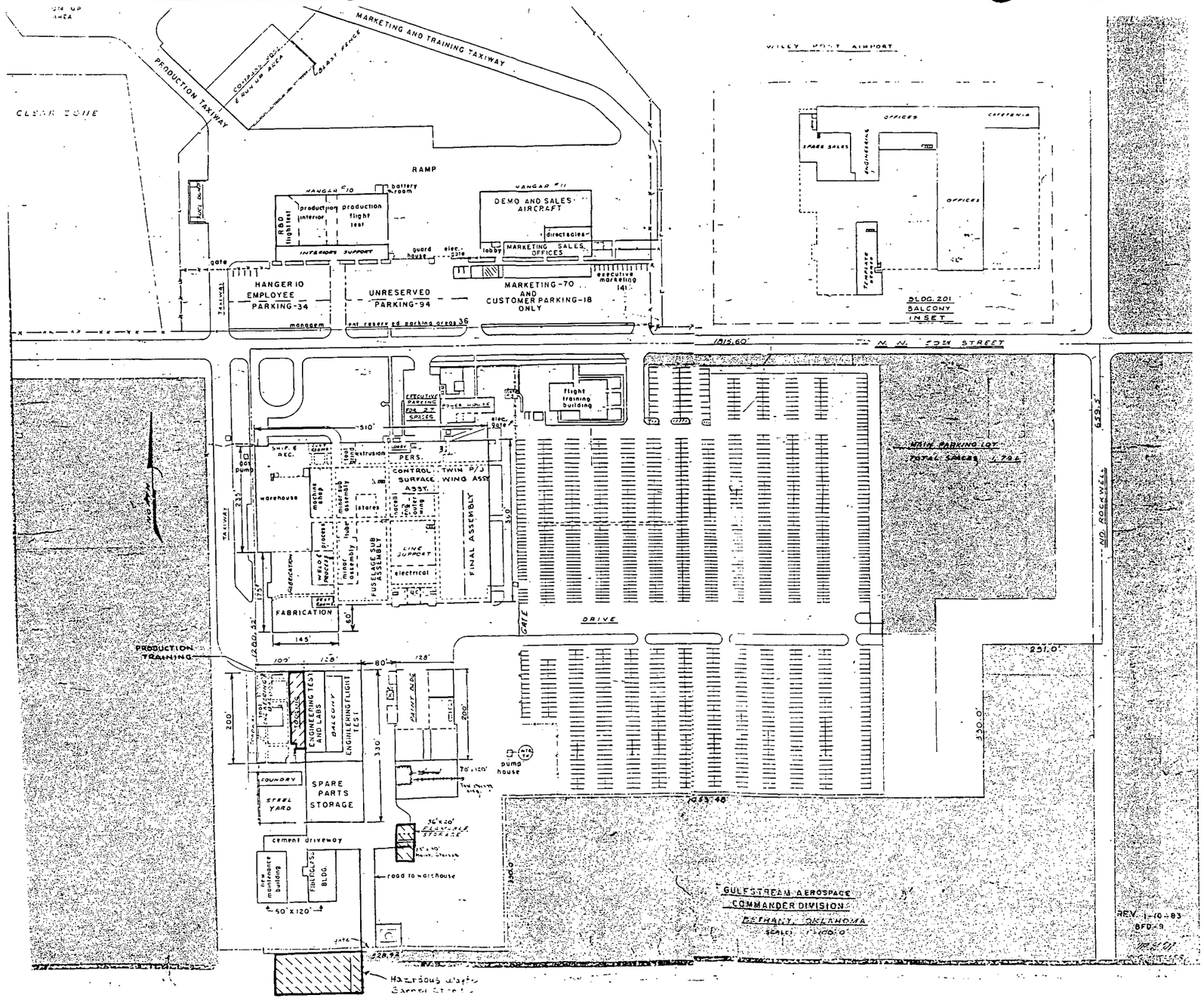
2.2 KNOWN AND POTENTIAL PROBLEMS

Potential contaminants of concern include the chromium and lead contaminated soil area. There are also several storage areas on-site which may be potential problems.

A hazardous waste storage area contains 55-gallon drums on a bermed concrete floor. The number of drums stored in this area is not known. The area encompases approximately 750 square feet and is located at the southern end of the plant (Table 1) (Ref. 1, p. 46).



Site Location Map
GULFSTREAM AEROSPACE CORP.
BETHANY, OK
TDD NO. F-06-9002-18
CERCLIS NO. OKD981518327
FIGURE 1



N

NOT TO SCALE

Site Sketch
GULFSTREAM AEROSPACE CORP.
BETHANY, OK
TDD NO. F-06-9002-18
CERCLIS NO. OKD981518327
FIGURE 2

Site Sketch
GULFSTREAM AEROSPACE CORP.
FIGURE 2

TABLE 1

DESCRIPTION OF CHEMICALS STORED AND USED AT
GULFSTREAM AEROSPACE, CORP.

	Location	Size of Area	Chemicals Stored
(1)	Hazardous Waste Storage Area	750 square feet	Variety of Wastes
(2)	Barrel House	20 x 40 feet flammable storage area	trichloroethylene methyl ethyl ketone liquid smut deoxidizer lubricants unknown others
(3)	Paint Storage Area	40 x 40 feet flammable storage area	paint thinner paints primer battery acid styrene toluene sodium silicate rubber cement
(4)	Tooling Area	80 square feet	petroleum distillates oil hydrofluoric acid sulfuric acid deoxidizer

A barrel house stores, in 55-gallon drums, chemicals used in the manufacturing process, including trichloroethylene, methyl ethyl ketone, liquid smut and lubricants. Approximately 3,500 gallons of chemicals are housed in a 20 x 40 foot section of a flammable storage area (Ref. 1, p. 47). A paint storage area is located within the larger flammable section. The paint area is 40 x 40 feet and is on the same wall as the barrel house. Chemicals stored in this area include paints, paint thinner, primer, battery acid, styrene and toluene (Table 1) (Ref. 1, p. 47).

A storage area is located outside the tooling section. Petroleum distillates, hydrofluoric acid, sulfuric acid, oil and deoxidizers are stored on a bermed concrete pad approximately 80 square feet. Approximately 1,400 gallons of chemicals are stored in this area (Ref. 1, p. 49).

The FIT conducted an off-site reconnaissance inspection on July 5, 1990. The FIT noted that Gulfstream Aerospace was surrounded by a 10 foot fence, with the main entrances on 50th Street. Most of the site consists of large buildings. Aircraft taxiways are located on the west and south sections. There are open fields on the east and west sides of Gulfstream.

The site is accessible through the main building. The gates along the south and west taxiway leading to 50th Street are kept locked. No storage areas were visible from the road.

The only files were found in the Waste Generator Section of the Oklahoma State Department of Health (OSDH) (Ref. 1).

2.3 REGULATORY INVOLVEMENT

No federal, state or local involvement has been documented.

3. WASTE CONTAINMENT AND HAZARDOUS SUBSTANCE IDENTIFICATION

Waste generation and containment are addressed in this section.

3.1 DOCUMENTATION

Information indicated a spill of hydrofluoric and chromic acid on May 22, 1986. Lead was found during sampling. The source of lead is apparently from lead contaminated foundry sand that had been dumped in the area (Ref. 1, p. 8).

3.2 WASTE GENERATION

Specific on-site wastes have not been identified. Labels were missing from drums of hazardous waste during the July 11, 1986 OSDH inspection (Ref. 1, p. 9). The hazardous waste storage area is approximately 750 square feet and located at the southern end of Gulfstream Aerospace (Ref. 1, p. 46).

3.3 CONTAINMENT

Containment systems were unable to be seen during the off-site reconnaissance inspection. The hazardous waste storage area is in the southern section of Gulfstream. All storage areas with concrete pads may be located within the site buildings (Ref. 1).

4. PATHWAY CHARACTERISTICS

This section characterizes environmental pathways and evaluates the potential of contaminant migration from the facility.

4.1 GROUND WATER

Terrace deposits of sand, silt, clay and gravel are known locally as the Bethany terrace. The City of Bethany pumps water from this terrace. The deposit also supplies water for residential gardening. Test holes drilled for the Bethany Water Department indicate that the terrace deposits have a maximum depth of approximately 80 feet. The depth to the water is approximately 30 feet from land surface. The ground water flow is generally toward Bluff Creek (Ref. 2, pp. 23 - 25).

Below the Bethany terrace deposits are the Garber Sandstone and Wellington Formation. The Garber and Wellington constitute a single aquifer and consist of lenticular beds of sandstone, siltstone and shale. Fresh water may be reached approximately 800 feet below the surface. The City of Bethany utilizes 3 ground water wells of undetermined depths from this aquifer (Ref. 2, pp. 29 - 30). The population of Bethany is approximately 23,000 (Ref. 5). Net precipitation for the area is 32 inches (Ref. 9).

4.2 SURFACE WATER

Gulfstream Aerospace lies northeast of Lake Overholser. Drainage from the site would proceed downgradient to Bluff Creek, which flows into the southern tip of Stinchcomb Wildlife Refuge before entering Lake Overholser. Drainage would need to travel approximately 1 mile overland before reaching Bluff Creek (Figure 1). The site does not lie within a 100 year floodplain (Ref. 6). The 2 year, 24 hour rainfall for this area is approximately 4 inches (Ref. 7).

Lake Overholser serves as a water supply source. The lake is used for boating and fishing. Swimming is not permitted (Ref. 3). Lake Overholser accepts water from the North Canadian River, which flows through Stinchcomb Wildlife Refuge (Figure 1). The Interior Least Tern, a rare species, lives around Rose Lake near the refuge. The Bald Eagle and Whooping Crane sporadically visit Stinchcomb Wildlife Refuge, but do not live there (Ref. 8).

4.3 SOIL EXPOSURE

Sample analysis indicated that the soil from a section of Gulfstream Aerospace became contaminated with chromium as a result of a spill of hydrofluoric and chromic acid on May 22, 1986. Analysis also indicated lead from foundry sand disposal (Ref. 1, p. 27). The spill area could not be identified from the FIT

off-site reconnaissance inspection. It is not known if the soil has been completely removed. The only public access would be through the building's main entrance. There are 2 large, locked gates along the taxiways on the south and west sides of the site. The number of on-site workers is not known.

4.4 AIR

The spilled contaminants of concern are heavy metals (chromium and lead). There is not a gas migration potential. The metals are, however, available for particulate transport. There are volatile components stored in 55-gallon drums on-site, but there is no documentation of past air releases. The nearest residents are within 500 feet of the site (Figure 1).

4.5 GROUND WATER RELEASE TO SURFACE WATER

The Bethany Terrace deposits are associated with stream courses. Water pumped from the terrace is used in Bethany for residential gardening. This ground water source is recharged by infiltration of precipitation on the terrace surface. The ground water is generally toward Bluff Creek (Ref. 2, pp. 23 and 25).

5. TARGETS

This section characterizes the environmental pathways and associated targets of contaminant migration from the facility.

5.1 GROUND WATER

The nearest well location is not known, but is potentially less than 500 feet from the site. Residents in the area use the shallow ground water for residential gardening (Ref. 2, p. 25). The City of Bethany has 3 ground water wells used for drinking water purposes (Ref. 2). Because Bethany is within a 4 mile radius of the site, it is likely that the City wells are also within this radius (Figure 1) (Ref. 1, p. 25; Ref. 4). The population of Bethany is approximately 23,000 (Ref. 5). Municipal wells are considered to be in a wellhead protected area.

5.2 SURFACE WATER

Bluff Creek is approximately 1 mile west, overland from Gulfstream Aerospace (Figure 1). Migration into the creek would not be rapid because Bethany is not prone to flooding (Ref. 6). The FIT noted that the base and sides of the creek had been dredged, then coated with cement. No fishing or intakes would be possible. Lake Overholser is used as a water supply source. The location and use of the intake have not been determined. Lake Overholser is also used for boating and fishing, but not swimming (Ref. 3).

5.3 SOIL EXPOSURE

The nearest residents are within 500 feet of the site (Figure 1). The population of Bethany within a 4 mile radius is approximately 23,000 (Ref. 5). The site is not readily accessible to the general public. The site is fenced and has locked gates along the taxiways leading to 50th Street.

5.4 AIR

The nearest resident is less than 500 feet from the site. The southern and eastern lands are used for residential purposes. The land to the north of Gulfstream is Wiley Post Airport, and the area to the west is the Stinchcomb Wildlife Refuge (Figure 1).

6. CONCLUSIONS

Gulfstream Aerospace, Corp. is a manufacturer of aircraft parts. Potential contaminants of concern are chromium and lead, which were detected in soil samples. Other potential contaminants of concern would be trichloroethylene, methyl ethyl ketone (barrel house), paint thinner, styrene, toluene (paint storage area), hydrofluoric acid, sulfuric acid, petroleum distillates (tooling area) and a variety of waste stored in the hazardous waste storage area. Ground water in Bethany is used for drinking and irrigational purposes. The surface water may be of concern because Bluff Creek (less than 1 mile from Gulfstream) flows into Stinchcomb Wildlife Refuge before emptying into Lake Overholser. Lake Overholser is used as a water supply, for boating and fishing, but not swimming. The soil exposure pathway is a concern for on-site workers. The general public, however, does not have access to the facility. The air exposure pathway is not of concern because the spill area contains only heavy metals and there is no documentation of past air releases.

PA DOCUMENTATION LOG SHEET SITE NAME Gulfstream Aerospace, Corp.

CITY Bethany STATE OK

IDENTIFICATION NUMBER OKD981518327

REFERENCE NUMBER	DESCRIPTION OF THE REFERENCE
1	Oklahoma Controlled Industrial Waste Compliance Inspection. Site Identification. Prepared by the Oklahoma State Department of Health. July 11, 1985.
2	Ground Water Resources, Cleveland and Oklahoma Counties. Oklahoma Geological Survey. Circular 71. 1968.
3	Record of Communication. Information on Surface Water Usage for Lake Overholser. From: Don L. Hudnall, FIT Toxicologist, ICF Technology, Inc. To: Pat Hestand, Oklahoma Water Resources Board. August 8, 1990.
4	Oklahoma Water Use Data System. Alphabetical Listing of Users with Permits. June 1, 1990.
5	Record of Communication. Population of Bethany, Oklahoma. From: Don L. Hudnall, FIT Toxicologist, ICF Technology, Inc. To: Paula Parker, Bethany, Oklahoma, Chamber of Commerce. August 9, 1990.
6	National Flood Insurance Program Community Status Book. Federal Emergency Management Agency. May 28, 1986.
7	Rainfall Frequency of the United States. U. S. Department of Agriculture. May 1961.
8	Record of Communication. Information on Sensitive Environments and Endangered Species. From: Don L. Hudnall, FIT Toxicologist, ICF Technology, Inc. To: John Skeen, Oklahoma Department of Wildlife. August 15, 1990.
9	U. S. Department of Commerce. Climatic Atlas of the United States. June 1982. Reprinted by the National Oceanic and Atmospheric Administration, 1983.

GULFSTREAM AEROSPACE CORP.

BETHANY, OKLAHOMA

F-6-9002-18
Photographer: Don L. Hudnall DLH
Witness: Robert Taaffe Robert Taaffe

Date: 7/5/90 **Time:** 1032
Direction: Facing south

(This photograph matches negative number 1)

Comments:
Photo showing west side of building.
This is the shipping area.
Taxiway running along west side of building.

Photograph Number 1

GULFSTREAM AEROSPACE CORP.

BETHANY, OKLAHOMA

F-6-9002-18
Photographer: Don L. Hudnall
Witness: Robert Taaffe

Date: 7/5/90 **Time:** 1033
Direction: Facing south

(This photograph matches negative number 2)

Comments:
Area just east of Gulfstream's shipping area.
Road in photo is 50th Street.
Circular driveway also in photo.

Photograph Number 2

GULFSTREAM AEROSPACE CORP.

BETHANY, OKLAHOMA

F-6-9002-18
Photographer: Don L. Hudnall DLH
Witness: Robert Taaffe Robert Taaffe

Date: 7/5/90 **Time:** 1034
Direction: Facing south

(This photograph matches negative number 3)

Comments:
Photo shows entrace to Gulfstream Aerospace.
Photo also shows 50th Street.
Parking lot is on left side of photo.

Photograph Number 3

GULFSTREAM AEROSPACE CORP.

BETHANY, OKLAHOMA

F-6-9002-18
Photographer: Don L. Hudnall DLH
Witness: Robert Taaffe Robert Taaffe

Date: 7/5/90 **Time:** 1035
Direction: Facing southwest

(This photograph matches negative number 4)

Comments:
Buildings on east side of Gulfstream Aerospace.
Building has Flight Safety written on side.
Building also has Gulfstream Commander written on side.

Photograph Number 4

GULFSTREAM AEROSPACE CORP.

BETHANY, OKLAHOMA

F-6-9002-18
Photographer: Don L. Hudnall DLH
Witness: Robert Taaffe Robert Taaffe

Date: 7/5/90 **Time:** 1036
Direction: Facing southeast

(This photograph matches negative number 5)

Comments:
Shipping area on left side of photo.
Open field on west side of Gulfstream.
Taxiway between buildings and open field.

Photograph Number 5

GULFSTREAM AEROSPACE CORP.

BETHANY, OKLAHOMA

F-6-9002-18
Photographer: Don L. Hudnall DLH
Witness: Robert Taaffe Robert Taaffe

Date: 7/5/90 **Time:** 1036
Direction: Facing southeast

(This photograph matches negative number 6)

Comments:
West side of Gulfstream Aerospace.
Photo also shows buildings behind main building.
Taxiway between buildings and open field.

Photograph Number 6

GULFSTREAM AEROSPACE CORP.

BETHANY, OKLAHOMA

F-6-9002-18
Photographer: Don L. Hudnall DLH
Witness: Robert Taaffe Robert Taaffe

Date: 7/5/90 **Time:** 1037
Direction: Facing southwest

(This photograph matches negative number 7)

Comments:
East side of Gulfstream Aerospace.
Buildings behind front building.
Open field east of Gulfstream property.

Photograph Number 7

Reference 1

Disp. Plan No. 55109

Permit No.

EPA I.D. NO. OKT410010821

OKLAHOMA CONTROLLED INDUSTRIAL WASTE COMPLIANCE INSPECTION

SITE IDENTIFICATION

Gulfstream Aerospace Corp. 5001 N Rockwell
A. Site Name B. Street (or other identifier)

Bethany OK 73008 Oklahoma
C. City D. State E. Zip Code F. County Name

Bill Humes Senior V.P. operator
G. Site Operator Information

1. Name S. Telephone Number

Owner: Chrysler Corp. 405-789-5000

3. Street 4. City 5. State 6. Zip Code

(Same)

H. Site Description

Manufacture Aircraft Parts

J. Type of Ownership

___1. Federal ___2. State ___3. County ___4. Municipal ✓5. Private

K. ✓1. Generator ___2. Transporter ___3. Treatment ___4. Storage ___5. Disposal

INSPECTION INFORMATION

A. Principal Inspector Information

1. Name Lynn Doty RS 2. Title Environmental Specialist

3. Organization OSDH 4. Telephone No. (area code & No.) 405-271-5338

B. Inspection Participants

Joe Reeves, Material & Process Engr. Gulfstream Aerospace Corp
Barbara Mars, Personnel Coordinator Aerospace Corp
Gayla D. Williams Records Clerk/dispatcher "

1/45

GENERATOR: Gulf Stream Aerospace

DATE: July 11, 1985

OKLAHOMA CONTROLLED INDUSTRIAL WASTE
COMPLIANCE INSPECTION REPORT
GENERATORS CHECKLIST

Note: On multiple part questions circle those not in compliance.

Section A EPA Identification Number.

Area of N/C

1. Does Generator have EPA ID Number. (Rule 1.2.4 IAW 262.12 - EPA ID Number) and approved Disposal Plan (Rule 3.1)? ✓ Yes ____ No

____ a. If yes, EPA ID Number OKT4100108 21

____ b. OSDH Disposal Plan Number 55109 ✓ Yes ____ No

Section B - Hazardous Waste Determination - (Rule 3.13 IAW 262.11)

1. Does generator generate hazardous waste(s) listed in Subpart D (Rule 2.1 IAW 261.30 - 261.33 - List of Hazardous Waste)? ✓ Yes ____ No

2. Does generator generate solid waste(s) that exhibit hazardous characteristics: (Corrosivity, ignitability, reactivity, EP toxicity) (Rule 2.3 IAW 261.20 - 261.24 - Characteristics of Hazardous Waste)? ✓ Yes ____ No

   a. If yes, list wastes and quantities on attachment. (Include EPA Hazardous Waste Number and Oklahoma Waste Code and provide waste name and description)

   b. Does generator determine characteristics by testing or by applying knowledge of processes? Both

      (1) If determined by testing, did generator use test methods in Part 261, Subpart C (or equivalent)? ✓ Yes ____ No
      USPCI did testing for Generators

      (2) If equivalent test methods used, attach copy of equivalent methods used.

3. Are there any other solid wastes deemed non-hazardous by generators? i.e. (process waste streams, collected matter from air pollution control equipment, water treatment sludge, etc.) ____ Yes ✓ No

   a. If yes, did generator determine non-hazardous characteristics by testing or knowledge of process?

   _____ NA

      (1) If determined by testing, did generator use test methods in Part 261, Subpart C (or equivalent)? ____ Yes ____ No

Area of N/C

(2) If equivalent test methods are used, attach copy of equivalent methods used.

b. List wastes and quantities deemed non-hazardous or processes from which non-hazardous wastes were produced. (Use narrative explanations sheet).

Section C - Manifest

1. Does generator ship hazardous waste off-site? (Subpart B - The Manifest) ✓ Yes ____ No

a. If no, do not fill out Section C and D.

b. If yes, identify primary off-site facility(s). ~~Use narrative explanations sheet.~~: USPCI Lone Mountain

2. Has generator shipped hazardous waste off-site since November 19, 1980? ✓ Yes ____ No

3. Is generator exempted from regulation because of:

Small quantity generator (Rule 2.2 IAW 261.55 - Special requirements) ____ Yes ✓ No
or
produces non-hazardous waste at this time (Rule 2.1 IAW 261.4 - Exclusions)? ____ Yes ✓ No

4. If not exempted does generator use a manifest? (Act 1-2010) ✓ Yes ____ No

a. If yes, is manifest form approved by OSDH? (Act 1-2010) ✓ Yes ____ No

(Check completed manifests at random. Indicate how many manifests were inspected, how many violations were noted and the type of violation).

5. Does all the following information appear on the manifest(s)? (Rule 4.3.1 IAW 262.20) ✓ Yes ____ No

(Circle deficiencies)

a. Manifest document number
b. Generator's name
c. Generator's EPA ID number
d. Generator's State ID number (disposal plan number)
e. Generator's adddress
f. Generator's telephone number
g. Generator's signature
h. Date that waste was offered for shipment
i. Transporter's name
j. Transporter's EPA ID number
k. Transporter's OK ID number

Area of N/C

l. Transporter's telephone number.
m. Secondary transporter information (if applicable)
n. Disposal facility name
o. Disposal facility EPA ID number
p. Disposal facility address
q. Facility's telephone number
r. Alternate facility information (if any)
s. D.O.T. description of waste(s)
t. Total quantity of each hazardous waste by units of weight or volume, and the type and number of containers as loaded onto vehicle.
u. EPA waste code (if applicable)
w. OK waste code

____ 6. (a) Did generator obtain hadwritten signature and date of acceptance from initial transporter? ✓ Yes ____ No

(b) Who signed and dated for transporter? (Rule 4.3.1)
Name Various Title Truck diver

____ 7. Does generator retain one copy of manifest signed by generator and transporter? (Rule 3.9) ✓ Yes ____ No

____ 8. Do returned copies of manifest include facility owner/ operator signature and date of acceptance?(Rule 3.10) ✓ Yes ____ No

____ 9. If copy of manifest from facility was not returned within 45 days, did generator file an exception report? (Rule 3.10 et.seq.) NA Yes ____ No

(a) If yes, did it contain the following information

1) Legible copy of manifest NA Yes ____ No

AND

2) Cover letter explaining generator efforts to locate waste. NA
____ Yes ____ No

____ 10. Does (will) generator retain both copies of manifest for 3 years? (Rule 1.3.1.5.1) ✓ Yes ____ No

Section D Pre-Transport Requirements
(THESE REQUIREMENTS APPLY ONLY TO CONTAINERS THAT ARE BEING OFFERED FOR SHIPMENT OFF-SITE)

1. Does generator package waste? ✓ Yes ____ No

If no, skip the rest of Section D
If yes, complete the following questions

____ 2. Does generator package waste in accordance with 49 CFR 173, 178, and 179? (DOT requirements)(Rule 3.16(a) IAW 262.30 - Packaging) ✓ Yes ____ No

Area of N/C

3. Inspect containers to be shipped. (Rule 3.16(a))

a. Are containers to be shipped leaking or corroding or bulging? ____Yes ✓ No

b. Use narrative explanations sheet to describe containers and condition.

c. Is there evidence of heat generation from incompatible wates in the containers? ____Yes ✓ No

4. Does the generator follow DOT labeling requirements before transport in accordance with 49 CFR 172? (Rule 3.16(c) IAW 262.31 labeling) USPCI does Labelling for facility ✓ Yes ____No

5. Does the generator mark each package before transport in accordance with 49 CFR 172? (Rule 3.16(c) IAW 262.32 -Marking) ✓ Yes ____No

✓ 6. Is each container of 110 gallons or less marked with the following label before transport? (Rule 3.16(c) IAW 262.32 - Marking) not all ____Yes ✓ No

Label saying: HAZARDOUS WASTE - Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency

Generator's Name and Address _____

_____

Manifest Document Number _____

7. If there are any vechicles present on site loading or unloading hazardous waste, inspect for presence of placards. Note this instance on narrative explanation sheet. (Rule 3.16(d) IAW 262.33) NA

SECTION E - Accumulation Time
(Rule 3.17 and 3.18 IAW 262.34 - Accumulation Time)

1. Is facility a permitted storage facility or does the facility have interim status? ____Yes ✓ No

2. If no:

✓ a. Is hazardous waste shipped off-site within 90 days Have been acceptions see narrative ____Yes ✓ No

b. Are containers used to store waste? ✓ Yes ____No

✓ (1) Is the beginning date of accumulation time clearly indicated ? (Rule ~~3.15~~ 3.16b) ____Yes ✓ No

Area of N/C

c. (1) Does generator inspect containers for leakage or corrosion? (Rule 3.16(a) IAW 265.174 - Inspections) Re-use product drums to ship Waste, USPCI provides overpacks ____Yes ✓No

d. (1) Does generator handle ignitable or reactive waste? ✓Yes ____No

(2) If yes, does generator locate containers holding ignitable or reactive waste at least 15 meters (50 feet) inside facility's property line? (Rule 3.16(a) IAW 265.176 - Special Requirements for Ignitable or Reactive Wastes) ✓Yes ____No

NOTE: If generator accumulates waste on-site for less than 90 days, fill out Generator Only Supplemental Checklist.

3. Describe storage area. ~~Use photos and narrative explantion sheet.~~: Concrete slab floor inside of storage building with special area roped off.

Section F-Recordkeeping and Records

1. Is generator keeping the following reports? (Rule 1.2.1.5.1 & 3.12 IAW 262.41 - Recorkeeping)(Note: the following must be kept for a minimum of three (3) years.)

a. Manifests and signed copies from designated facilities? ✓Yes ____No

b. Quarterly Reports (Rule 3.12, 3.7) ✓Yes ____No

c. Exception Reports (Rule 3.10) NA Yes ____No

d. Test results where applicable. ✓Yes ____No

e. Biennial Reports for each odd number year (Rule 3.12) ✓Yes ____No

2. Where are records kept (at facility or elsewhere)?

At facility Office

3. Who is in charge of keeping the records?

Name Gayla Williams Title Records Clerk/Dispatches

Section G. - Special Condition

1. Has generator received from or transported to a foreign source any hazardous waste? (Rule 3.11 IAW 262.50 - International Shipments) ____Yes ✓No

Area of N/C

If yes,

_____ a. Has he filed a notice with the Director

NA _____Yes _____No

_____ b. Is this waste manifested and signed by Foreign Consignee?

_____Yes _____No

_____ c. If generator transported wastes out of the country has he received confirmation of delivered shipment?

_____Yes _____No

Gulfstream 7/11/86

Generators Checklist Narrative

Item

B.1+B2 The types of Wastes and quantities are attached to this checklist as photocopies of the biennial report, disposal plan and facility records. In addition to the attached lists of Wastes the facility has contaminated soil to dispose of. On May 22, 1986 a spill of hydrofluoric and Chromic acid was reported and the removed soil was sampled. The attached lab report shows this contaminated soil to be EP Toxic for Chromium. After soil removal the ground was sampled by compositing soil every fifty feet along the spill area. The ground sample data is also attached and shows an EP toxic value for lead. It was discovered during sampling that lead contaminated foundry sand had been previously dumped on the ground. The lead contaminated area was colored a dark brown. The facility must initiate a clean-up program for the lead contaminated area. All lead and chromium contaminated soil must be disposed of as a hazardous waste. A memo to the files was written regarding the spill incident.

Gulfstream 7/11/86

Generators
Checklist Narrative Con't

Item

D.6+ E.6.1 Most of the Containers in the storage area did not have the required labels identifying hazardous Waste. Those containers which lacked labels also lacked the beginning date of accumulation time.

E.a The facility is in the process of cleaning out old chemical products and as a result has accumulated a large amount of waste. USPCI packed and labelled the extra waste for shipping. The regular waste was not labelled and all of the containers were stored for more than 90 days while cleanup progressed. The philosophy for exceeding the 90 day limit was to save money by shipping all generated waste at one time to cut transport cost. The date on labelled drums was March 6, 1986.

Do not make entries in shaded areas

OMB #: 2050-0024 Expires: 5-31-88

ENVIRONMENTAL PROTECTION AGENCY

GENERATOR BIENNIAL HAZARDOUS WASTE REPORT FOR 1985

This report is for the calendar year ending December 31, 1985
Read All Instructions Carefully Before Making Any Entries on Form

I. NON-REGULATED STATUS

Complete this section only if you did not generate regulated quantities of hazardous waste at any time during the 1985 calendar year. Circle the one code at right that best describes your status during the entire year (see instructions for explanation of codes).

mailed 4-8-86

1 Non-handler
2 Small Quantity Generator
4 Exempt
5 Beneficial Use
9 Out of Business

Please print/type with elite type (12 characters per inch)

This Installation's Non-Regulated Status is Expected to Apply:

☐ For 1985 Only ☐ Permanently

☐ Other_____

II. GENERATOR'S EPA I.D. NUMBER

T/A C

F	0	K	T	4	1	0	0	1	0	8	2	1		1
1	2											13	14	15

C303 ENTRY (OFFICIAL USE ONLY): ☐

III. NAME OF ESTABLISHMENT

GULF STREAM AEROSPACE CORPORATION

30 69

IV. ESTABLISHMENT MAILING ADDRESS

[3] P.O. BOX 22500

15 16 45

Street or P.O. Box

[4] OKLAHOMA CITY OKLAHOMA 73123

15 16 41 42 47 51

City or Town State Zip Code

V. LOCATION OF ESTABLISHMENT (if different than section IV above)

[5] 7400 NW 50th STREET

15 16 45

Street or Route number

[6] OKLAHOMA CITY OKLAHOMA 73123

15 16 41 42 47 51

City or Town State Zip Code

VI. ESTABLISHMENT CONTACT

[2] HUMES BILL

15 16 45

Name (last and first)

405-789-5000

46 55

Phone No. (area code & no.)

VII. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Bill M. Humes	Sr. Vice-Pres	Bill M Humes	4-3-86
Print/Type Name	Title	Signature	Date Signed

Tear out here

Do not make entries in shaded [illegible] ENVIRONMENTAL PROTECTION A[illegible]

Generator Biennial Hazardous Waste Report for 1985 (cont.)

This report is for the calendar year ending December 31, 1985

Date rec'd: _____ Rec'd by: _____

VIII. GENERATOR'S EPA I.D. NO.

T/A C

G	0	K	T	4	1	0	0	1	0	8	2	1		1
1	2											13	14	15

X. FACILITY'S EPA I.D. NO.

F	0	K	D	0	6	5	4	3	8	3	7	6
16												28

XII. TRANSPORTATION SERVICES USED

U.S. Pollution Control, Inc.
OKD981046295

IX. FACILITY NAME (specify facility to which all wastes on this page were shipped)

Lone Mountain

XI. FACILITY ADDRESS

RR 2, Box 180A
Waynoka, OK 73860

XIII. WASTE IDENTIFICATION

Sequence #	Line #	A. Description of Waste	B. DOT Hazard code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
29 32	1	Mixed acid waste, corrosive liquid, from pickling of steel from cad plating process	02 (33 34)	D002 (35 38 / 39 42 / 43 46 / 47 50)	5500 (51 58)	8.7 lb./gal G (60)
	2	Soil contaminated w/oil	15	0000	2255	12.0 lb./gal G
	3	Zyglo penetrant used for finding cracks in metal	15	0000	110	6.5 lb./gal G
	4	Zinc chromate paint sludge, by-product of paint booths	15	0000	2090	10.0 lb./gal G
	5	Dried paint waste, by-product of paint booths (sensitizer)	15	0000	660	8.7 lb./gal G
	6	Styrene, used to make fiberglass parts	08	D001	55	10.4 lb./gal G
	7	Oil & water (mainly water)	15	0000	1650	8.3 lb./gal G
	8					
	9					
	10					
	11					
	12					

XIV. COMMENTS (enter information by section number—see instructions)

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Do not make entries in shaded areas

ENVIRONMENTAL PROTECTION AGENCY

General Biennial Hazardous Waste Report for 1985 (cont.)

This report is for the calendar year ending December 31, 1985

Date rec'd: _____ Rec'd by: _____

VIII. GENERATOR'S EPA I.D. NO.

1	2											13	14	15
G	O	K	T	4	1	0	0	1	0	8	2	1	T/A	C

IX. FACILITY NAME (specify facility to which all wastes on this page were shipped)

Hydrocarbon Recylers, Inc.

X. FACILITY'S EPA I.D. NO.

16												28
F	O	K	D	0	0	0	6	3	2	7	3	7

XI. FACILITY ADDRESS

5354 W. 46th St. South
Tulsa, Okla. 74157

XII. TRANSPORTATION SERVICES USED

U.S. Pollution Control, Inc.
OKD981046295

XIII. WASTE IDENTIFICATION

Sequence #	Line #	A. Description of Waste	B. DOT Hazard code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
29–32	1	Methyl Ethyl Ketone	08 (33–34)	U159 (35–38)	220 (51–59)	6.7 lb./gal G (60)
	2	Stoddard solvent, used in degreasing	08	D001	110	6.8 lb./gal G
	3	JP50, jet fuel	08	D001	275	6.7 lb./gal G
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					

XIV. COMMENTS (enter information by section number—see instructions)

Tear out here

Do not make entries in shaded areas

ENVIRONMENTAL PROTECTION AGENCY

Generator's Biennial Hazardous Waste Report for 1985 (cont.)

This report is for the calendar year ending December 31, 1985

Date rec'd: _____ Rec'd by: _____

VIII. GENERATOR'S EPA I.D. NO.

T/A C

G	O	K	T	4	1	1	0	0	1	1	0	8	2	1	1
1	2												13	14	15

X. FACILITY'S EPA I.D. NO.

F	O	K	D	O	6	5	4	3	8	3	7	6
16												28

IX. FACILITY NAME (specify facility to which all wastes on this page were shipped)

Lone Mountain

XI. FACILITY ADDRESS

RR 2, Box 180A
Waynoka, OK 73860

XII. TRANSPORTATION SERVICES USED

U .S. Pollution Control, Inc.
OKD981046295

XIII. WASTE IDENTIFICATION

Sequence #	Line #	A. Description of Waste	B. DOT Hazard code	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
29 32	1	Mixed acid waste, result of pickling of steel from cad plating and anodizing process	0 2 33 34	D 0 0 2 35 38 39 42 43 46 47 50	9 0 0 0 0 51 59	8.7 lb./gal G 60
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					

Tear out here

XIV. COMMENTS (enter information by section number—see instructions)

1985 Generated - Stored on-site less than 90 days as of December 31, 1985

Do not make entries in shaded areas

ENVIRONMENTAL PROTECTION AGENCY

Generator Biennial Hazardous Waste Report for 1985 (cont.)

This report is for the calendar year ending December 31, 1985

Date rec'd: _____ Rec'd by: _____

XV. GENERATOR'S EPA I.D. NO.

													T/A	C
G	0	K	T	4	1	0	0	1	0	8	2	1		1
1	2											13	14	15

XVI. WASTE MINIMIZATION (narrative description)

Due to economic conditions, our facility was forced to discontinue the manufacture of aircraft which resulted in less hazardous waste being generated than previous years. This provided us sufficient time to do a detail cleanup and dispose of excessive materials we had accumulated so we could set up a more efficient inventory control. We are presently implementing a complete program to dispose of our chemicals every 90 days. We are also informing the employees of their right to know of what materials they are handling and providing Material Safety Data Sheets upon request. We have made an effort to dispose of hazardous material in 1985 by cleaning up old pits to prevent any contamination.

Tear out here

14

CONTROLLED INDUSTRIAL WASTE GENERATOR'S LISTING

This is a listing of all Controlled Industrial Wastes reported to the Oklahoma State Department of Health, Industrial Waste Division as being generated and disposed of by the Business/Plant named below, as of the date specified. This is not a permit and does not constitute authorization of any particular disposal practice, method or site.

Disposal Plan Number 55109, amending plan approved September 6, 1985

has been assigned, as of October 21, 1985, to: EPA ID Number OKT410010821

Business/Plant Name Gulfstream Aerospace Corp. Commander Business Aircraft

Mailing Address 5001 N. Rockwell, Bethany, OK 73008

Plant Address/Location 7400 Northwest 50th, Oklahoma City, OK 73123

Person in Charge of Facility Bill Humes, V.P. Phone No. (405) 789-5000

NO.	STATE WASTE CODE	FEDERAL WASTE CODE	CHARACTERISTIC	DESCRIPTION	USPCI TRANS-PORTER	USPCI RECEIVING FACILITY	REMARKS
1	020111		Corrosive	Acid and sludge	2004	SD47002	
2	020102		Corrosive	Mixed acid wastes	2004	SD47002	
3	020102		Corrosive	Chromic acid	2004	SD47002	
4	654103		Sensitizer	Dried paint waste Contains Zinc Chromate / in Resins + Solvents	2004	SD47002	
5	664116		Toxic	Styrene	2004 @	## SD47002	
6	163802		Toxic One Time	PCB's	2005 #	AL00781+	
7	064600		Toxic	Zyglo Penetrant	2004	SD47002	
8	104110	U159	Flammable	MEK	2004	RR47001*	
9	104611		Flammable	Stoddard Solvent	2004	RR47001*	
10	103000		Flammable One Time	Jet fuel Bottoms of tank being emptied	2004	RR72001	

Facility Contact: Prepared by: AAC, LJB

\# Alternate hauler is 2004
+ Alternate disposal site is AR00249
~~## Alternate disposal site is RR83010~~
@ Alternate haulers are 1085 and 3055
* Alternate disposal site RR72001

Have waste oils which are Recycled from hydropress 2 x's / yr @ 500-600 gallons each
Taken directly from process units

Clean up this year will be amounting in increases on disposal amts

Mailed 12-5-85

OKLAHOMA STATE DEPARTMENT OF HEALTH
INDUSTRIAL & SOLID WASTE SERVICE

ODH Form No. 859 (6-1-82)

CONTROLLED INDUSTRIAL WASTE GENERATOR'S LISTING

This is a listing of all Controlled Industrial Wastes reported to the Oklahoma State Department of Health, Industrial Waste Division as being generated and disposed of by the Business/Plant named below, as of the date specified. This is not a permit and does not constitute authorization of any particular disposal practice, method or site.

Disposal Plan Number 55109, amending plan approved September 6, 1985

has been assigned, as of October 21, 1985, to: EPA ID Number OKT410010821

Business/Plant Name Page 2

Mailing Address

Plant Address/Location

Person in Charge of Facility Phone No. ( )

NO.	STATE WASTE CODE	FEDERAL WASTE CODE	CHARACTERISTIC	DESCRIPTION	TRANS-PORTER	RECEIVING FACILITY	REMARKS
11	093302	One Time tank	cleanout Unclassified	Waste oil/water	2004	SD47002	
12	793313	One Time Disposal	Unclassified	Oil contaminated soil	2004	SD47002	

Facility Contact:

Prepared by: AAC,LJB

OKLAHOMA STATE DEPARTMENT OF HEALTH
INDUSTRIAL & SOLID WASTE SERVICE

ODH Form No. 859
(6-1-82)

Description: Industrial Waste Disposal Report for 1980 ↓ 1981 ↓ 1982

1980

Qtr. Ending ↓ Date	Quantity	Dept. No.	Vendor	P.O. No.	Price	Remarks
12-31-80	None	020	None	None	ø	ø
6-30-80	6,000 gal.	020	U.S. Pollution Control	21BC239635	$2,178.06	Selcon 29 Corrosive Solution
9-30-80	None	020	None	None	ø	ø
12-31-80	None	020	None	None	ø	ø

1981

Qtr. Ending ↓ Date	Quantity	Dept. No.	Vendor	P.O. No.	Price	Remarks
3-31-81	None	020	Did not send report - waiting for new disposal plan number			
6-30-81	None	020	Did not send report - waiting for new disposal plan number			
9-30-81	4,400 gal.	020	U.S.D.C.	21BC202329	$1,628.64	caustic waste acids & sludge
	5,000 gal.	"	"	21BC202452	$1949.62	caustic chromic acid solution
	5,000 gal.	"	U.S.P.C.	21BC202500	$1,821.41	chromic acid solution
12-31-81	32 drums	020	U.S.P.C.	21BC202693	$2,432.00	caustic chromic-acid solution

1982

Qtr. Ending ↓ Date	Quantity	Dept. No.	Vendor	P.O. No.	Price	Remarks
3-31-82	None	020	None	None	ø	ø (Xerox copy)
6-30-82	13 drums	020	U.S.P.C.	21BC207390	$1,425.00	Chromic Acid solution
	5,000 ~~5,007~~ gal.	"	U.S.P.C.	207471	$4,331.00	Chromic Acid solution
	5,100 gal.	"	U.S.P.C.	"		Dried paint waste
9-30-82	15 drums	020	U.S.D.C.	207657	$1,871.00	Polyester Styrene
	2 drums	"	"	"		zinc chromate sludge
12-31-82	~~None~~	~~020~~	~~None~~	~~None~~	ø	ø
	1 drum	020	U.S.P.C.	208042	$1,506.00	Chemical cleaners
	4 drums	"	"	"		Paint waste
	1 drum	"	"	"		Resin

Form 480 (10-60)

Description:

Industrial Waste Disposal Report for 1983

Qtr. Ending 1983

Date	Quantity	Dept. No.	Vendor	P.O. No.	Price	Remarks
1-23-83	1 drum	020	U.S.P.C.	208042		Chemical ~~Illegible~~
	~~4 drums~~	"	"	"		~~Paint~~
3-31-83	ø	020	—	—		ø
30-83	5,000 gal.	020	U.S.P.C.	213529	2,148.45	Deoxidizer
30-83	2 gal.	020	U.S.P.C.	213815	1,097.00	PCB transformer oil
	4,5000 gal	020	"	213788	4,169.86	Mixed acid wastes
2-31-83	9,155 gal.	020	Diaz Refinery ~~Abbott~~	214214	1,050.00	Zinc chromate
	~~550~~ 385 gal.	020	"	"	~~550.00~~ 350.00	Resin & Solvents
				1984		
3-31-84	5,100 gal.	020	U.S.P.C.	214637	1,881.46	Acid & sludge combine
30-84	ø	020	—	—		—
1-30-84	ø	020	—	—		—
2-31-84	ø	020	—	—		—

Description:

Qtr. Ending 1985

Date	Quantity	Dept. No.	Vendor	P.O. No.	Price	Remarks
-31-85	None	020	—	—	—	—
-31-85	(4-24) 5500 gal.	020	U.S.P.C.	217293	*2852.29	Mixed acid wastes
-30-85	None	020	—	—	—	—
-31-85	(11-11-85) 3255 gal.	020	U.S.P.C. (to Lone Mountain)	216673	*6,796.90 Total	Soil contaminated w/oil
	(11-11-85) 110 gal.	"	"	"		24/0 penetrant
	(11-11-85) 1210 gal.	"	"	"		* zinc chromate paint sludge
	(11-11-85) 110 gal.	"	"	"		chromic acid, neutralized pH7
	(11-11-85) 55 gal.	"	"	"		Styrene
	(12-11-85) 220 gal.	"	U.S.P.C. (to Hydrocarbon Recyclers)	216709	*5,620.65	MEK
	(12-11-85) 110 gal.	"	"	"		Stoddard Solvent
	(12-11-85) 275 gal.	"	"	"		Jet fuel (JP50)
	(12-11-85) 1,650 gal.	"	" (to Lone Mountain)	"		Oil & water
	(12-11-85) 880 gal.	"	"	"		* Zinc Chromate paint sludge
660	(12-11-85) ~~220~~ gal.	"	"	"		* Dried paint waste
Total	Gal. for Year 1985	~~13,035~~ 13,595			* All	same ORIG. Waste Code No.

480 (10-80)

Description:

Qtr. Ending 1986

Date	Quantity	Dept. No.	Vendor	P.O. No.	Price	Remarks
31-86	(1-6-86) 5000 gal.	020	U.S.P.C.	216726	$2,670.11	Mixed acid wastes
	(1-16-86) 4000 gal.	020	U.S.P.C.	216741	$2,169.71	Mixed acid wastes
30-86		(Did not report?	report on quarterly report ↓ Hydrocarbon Recyclers	not considered haz. waste) 218887	$ 960.00	100 octane aviation Fuel
30-86						

SAMPLE NUMBER 133407 00000
DATE COLLECTED 05/27/86
DATE RECEIVED 05/28/86
DATE COMPLETED 06/18/86
STATION
COLLECTED BY LYNN DOTY

OKLAHOMA STATE DEPARTMENT OF HEALTH
STATE WATER QUALITY LABORATORY
WATER ANALYSIS REPORT

RECEIVED
JUN 20 1986

Soil removed and placed in Storage bins

DWAIN FARLEY, CHIEF
WASTE MANAGEMENT SERVICE
OSDH ROOM 803
OKLAHOMA CITY OK 73152

COPY
Waste Management Service

GENERAL PROJECTS

CONCENTRATION IN SAMPLE

PARAMETER		VALUE	UNITS	PARAMETER		VALUE	UNITS
FLUORIDE IN SEDIMENT		28.80	MG/KG	PH (LAB)		11.60	STD UNI
ARSENIC IN SEDIMENT	<	3.00	MG/KG	BARIUM IN SEDIMENT		52.00	MG/KG
CADMIUM IN SEDIMENT		9.71	MG/KG	EP TOX CHROMIUM		26800	UG/L
CHROMIUM IN SEDIMENT		1281.00	MG/KG	LEAD IN SEDIMENT		156.00	MG/KG
EP TOX LEAD	<	45	UG/L	MERCURY IN SEDIMENT	<	0.05	MG/KG
SELENIUM IN SEDIMENT		4.63	MG/KG	SILVER IN SEDIMENT	<	0.35	MG/KG

REMARK CODE EXPLANATIONS

< LESS THAN DETECTION LIMIT

SEE REVERSE SIDE FOR WATER QUALITY REPORT SIGNIFICANCE

SOURCE GULFSTREAM AEROSPACE SURFACE CITY OKLAHOMA CITY
PROGRAM WASTE MGMT SER(GENERAL PROJ)
COUNTY OKLAHOMA

LEGAL
/4 /4 /4 SEC T R M

SAMPLERS COMMENTS CHROMIC AND HYDROFLUORIC ACIDS WERE SPILLED ON GROUND AND NEUTRALIZED WITH SLATE LIME

ANALYST'S COMMENTS No free liquid

(FORM NO 814 5-77) REQUISITIONER COPY 21 ANALYST Cliff Patton

SAMPLE NUMBER 133406
DATE COLLECTED 05/27/86
DATE RECEIVED 05/28/86
DATE COMPLETED 06/18/86
STATION
COLLECTED BY LYNNE DOTY

00000

OKLAHOMA STATE DEPARTMENT OF HEALTH
STATE WATER QUALITY LABORATORY
WATER ANALYSIS REPORT

RECEIVED
JUN 2 9 1986
Waste Management Service

Soil Remaining on Ground after Clean-up operations

DWAIN FARLEY, CHIEF
WASTE MANAGEMENT SERVICE
OSDH ROOM 803
OKLAHOMA CITY OK 73152

COPY

GENERAL PROJECTS

CONCENTRATION IN SAMPLE

PARAMETER		VALUE	UNITS	PARAMETER		VALUE	UNITS
FLUORIDE IN SEDIMENT		110.00	MG/KG	PH (LAB)		11.10	STD UNI
ARSENIC IN SEDIMENT		11.87	MG/KG	BARIUM IN SEDIMENT		47.75	MG/KG
CADMIUM IN SEDIMENT		9.05	MG/KG	EP TOX CHROMIUM		911	UG/L
CHROMIUM IN SEDIMENT		641.60	MG/KG	LEAD IN SEDIMENT		4850.00	MG/KG
EP TOX LEAD		11970	UG/L	MERCURY IN SEDIMENT	<	0.05	MG/KG
SELENIUM IN SEDIMENT		5.50	MG/KG	SILVER IN SEDIMENT	<	0.35	MG/KG

REMARK CODE EXPLANATIONS

< LESS THAN DETECTION LIMIT

SEE REVERSE SIDE FOR WATER QUALITY REPORT SIGNIFICANCE

SOURCE GULFSTREAM AEROSPACE SURFACE
PROGRAM WASTE MGMT SER (GENERAL PROJ)
COUNTY OKLAHOMA
CITY OKLAHOMA CITY

LEGAL
/4 /4 /4 SEC T R M

SAMPLER'S COMMENTS CHROMIC AND HYDROFLUORIC ACIDS WERE SPILLED ON GROUND AND NEUTRALIZED WITH SLATE LIME, SAMPLE 1

ANALYST'S COMMENTS No free liquid

OD FORM NO 814 (8-77) REQUISITIONER COPY 22 ANALYST

PLANT Gulfstream Aerospace

DATE July 14, 1986

GENERATOR ONLY SUPPLEMENTAL CHECKLIST

Use these pages for Generators which accumulate at least ~~1000 k.g.~~ of waste in 1.) Tanks or 2.) Containers and Do Not Store Over ~~90 Days~~ (Required by Rule 3.16)

In Violation of 90 Day Storage Requirement

Area of N/C

Personnel Training

1. Does the owner/operator have a personnel training program that includes where applicable: (IAW 265.16 - Personnel Training)

See Narrative

____	a)	Procedures for using, inspecting, repairing, and replacing facility emergency equipment.	✓ Yes ____ No
____	b)	Key parameters for automatic waste feed cut-off systems.	NA Yes ____ No
____	c)	Procedures for using communications or alarm systems.	✓ Yes ____ No
____	d)	Responses to fires or explosions.	✓ Yes ____ No
____	e)	Responses to groundwater contamination incidents.	✓ Yes ____ No
____	f)	Shutdown of operations.	✓ Yes ____ No

✓ 2. Is the training program directed by a person trained in hazardous waste management procedures? (IAW 265.16 - Personnel Training) ____ Yes ✓ No

✓ 3. Does the owner/operator maintain Personnel Training records at the facility? (IAW 265.16--Personnel Training) ____ Yes ✓ No

a) If yes, do they include:

NA

1. Job title for each position related to controlled industrial waste management and the name of each employee filling a position? ____ Yes ____ No
2. Written job description for each job title including the requisite skill, education or other equivalent education and duties of personnel assigned to each position? ____ Yes ____ No
3. Description of type and amount of both introductory and continuing training that will be given to each person filling a position. ____ Yes ____ No
4. Records that document that the required training has been given to or completed by facility personnel? ✓ Yes ____ No

Area of N/C

✓ (b) Do personnel take part in an annual review of the training required? ___Yes ✓No

Section B - Preparedness and Prevention

✓ (1) Is there evidence of fire, explosion or contamination of the environment? (IAW 265.31 -Maintenance and operation of facility) ✓Yes ___No

If yes, use narrative explanations sheet to explain.

2. Is the facility equipped with (IAW 265.32 - Required equipment)

___ a) Internal communications or alarm system capable of providing immediate emergency instruction to facility personnel? (Voice or signal) ✓Yes ___No

___ b) Telephone or two-way radio (that is immediately available at the scene of operations) to call emergency response personnel? ✓Yes ___No

___ c) Portable fire extinguishers, fire control equipment, spill control equipment and decontamination equipment? ✓Yes ___NO

___ (1) Is this equipment tested to assure its proper operation? (IAW 265.33 - Testing and maintenance of equipment) ✓Yes ___No

___ d) Water of adequate volume for hoses, sprinklers or water spray system?

1. Describe source of water Onsite Storage Tank for Back-up to City of Bethany Water

2. Indicate flow rate and/or pressure and storage capacity if applicable. Acceptable Storage tank holds 210,000 gallons

3. Is there sufficient aisle space to allow unobstructed movement of personnel and equipment? (e.g. adequate aisle space in between barrels to check for leakage, corrosion and proper labeling, etc.) (265.35 - Required aisle space) ___ ✓Yes ___No

(4.) Has the owner/operator made arrangements with the local authorities to familiarize them with characteristics of the facility? (Layout of facility, properties of hazardous waste handled and associated hazards, places where facility personnel would normally be working, entrances to roads inside facility, posible evacuation routes) (IAW 265.37 - Arrangements with local authorities) Not written need to give a copy of contingency plan ___Yes ✓No

___ If no, has the owner/operator attempted to make such arrangements? Fire department has inspected the facility. Verbal discussions ✓Yes ___No

Area of N/C

5. In the case that more than one police or fire department might respond, is there a designated primary authority? (IAW 265.37 -Arrangements with local authorities) ✓ Yes ___ No

   a) If yes, indicate primary authority Wiley Post Airport Fire Dept.

   b) Is the fire department a city or volunteer fire department? City

6. Does the owner/operator have phone numbers of and agreements with State emergency response teams, emergency response contractors and equipment suppliers? (IAW 265.37 - Arrangements with local authorities) ✓ Yes ___ No

   Are they readily available to the emergency coordinator? ✓ Yes ___ No
   Barbara Mann Personnel Office/Public Rel.

7. Has the owner/operator arranged to familiarize local hospitals with the properties of hazardous waste handled and types of injuries that could result from fires, explosions, or releases at the facility? ✓ Yes ___ No

   If no, has the owner/operator attempted to do this? NA Yes ___ No

8. If the State, or local authorities decline to enter into the above referenced agreements, has this situation been entered in the operating record? (IAW 265.37 -Arrangements with local authorities) NA Yes ___ No

Section C - Contingency Plan and Emergency Procedures

1. Does the facility have a contingency plan? (IAW 265.51 - Purpose and implementation of Contingency Plan) ✓ Yes ___ No

   a) If yes, is it maintained at the facility? (IAW 265.53 -Copies of Contingency Plan) ✓ Yes ___ No

2. Is the contingency plan a revised SPCC Plan? (IAW 265.52 - Content of Contingency Plan)) ___ Yes ✓ No

3. Does the contingency plan contain the following information: (IAW 265.52 - Content of Contingency Plan) ✓ Yes ___ No

   a) A description of the actions to be taken by facility personnel in the event of fire, explosion, or release of controlled industrial waste? ✓ Yes ___ No

   b) A description of the arrangements with local authorities? ✓ Yes ___ No

Area of N/C

c) A list of names, addresses, and phone numbers (office and home) of all persons qualified to act as emergency coordinator? ____Yes ✓No

d) A list of all emergency equipment including 1) the location of each item 2) a physical description of each item on the list and 3) an outline of each item's capabilities? Partial ____Yes ✓No

e) An evacuation plan where there is a possibility that evacuation could be necessary including ____Yes ✓No

1) signals to begin evacuation
2) evacuation routes
3) alternate evacuation routes

____ 4. Is there an emergency coordinator on site or within short driving distance of the plant at all times? (IAW 265.55 - Emergency Coordinator) ✓Yes ____No

✓ 5. Has the facility supplied all local authorities and State response teams with a copy of the contingency plan? (IAW 265.53 - Copies of Contingency Plan) ____Yes ✓No

____ 6. Has the contingency plan ever been implemented? (IAW 265.56 - Emergency Procedures) ✓Yes ____No

a) If yes, was a written report submitted to the Director within 15 days after the incident? NA Yes ____No

Gulfstream 7/11/86

Generator Only Checklist Narrative

Item

x 1.0 The Contingency plan contains an outline for a personnel training program. This outline however
x 2.0 has not been implemented. A person trained in hazardous waste management procedures is not
x 3.0 directing a training program. As no training program is carried out there are no training records and annual reviews are non-existant.

x B.1 On May 22, 1986 Gulfstream reported a waste spill of hydrofluoric and Chromic acids onto the ground. This soil was neutralized and removed to storage bins. Removed soil was EP toxic for Chromium. In situ soil showed lead contamination from foundry sand disposal which as yet has not been removed and is EP toxic. See narrative to generators checklist item B.1 & B.2.

xC-3.C The Contingency plan does not spell out the names and addresses or phone numbers for the
C.3.d emergency coordinator(s). More details are needed regarding the list of emergency equipment to include the locations of each item and the items
C.3.e capabilities. Evacuation routes and alternate routes are not marked on the facility Contingency map. The map contains extraneous information and does not

Gulfstream 7/11/86

Generators Only Narrative Cont

Item

depict the currently used waste storage areas. The text needs to include the storage tank which was added since the plan was written in 1982. The text of the Contingency plan (page 3) states the storage area for Containers is used for waste remaining an excess of 90 days. The sentence should read not in excess of 90 days. Appendix E of the Contingency plan has an inspection form for the Container storage area but not one for inspecting the tank and safety and emergency equipment. Appendix I lists the agencies who are to receive incident reports; the Director of OSDH Industrial Waste division was left off this list. Appendix 6 States ammendments will be made to the contingency plans 6 months after review, the regulations require that ammendments be made immediately. This Contingency plan must be updated. Local authorities have not been provided a copy of the contingency plan — they must be provided an ammended version as the existing plan is out of date.

X C.5

FACILITY Gulf Stream Aerospace

DATE 7/11/86

CONTAINERS STORAGE CHECKLIST
(Rule 7.1.6 & 7.8)

Area of N/C			
	1.	Does the facility store hazardous waste in containers? (IAW 265.170) (Includes hoppers and gondolas)	✓ Yes ___ No
		If no, do not complete this form.	
___	2.	Are the containers in good condition? (check for leaks, corrosion, bulges, etc.)	✓ Yes ___ No
___	3.	If a container is found to be leaking, does the operator transfer the hazardous waste from the leaking container? (IAW 265.171)	✓ Yes ___ No
___	4.	Is the waste compatible with the containers and/or its liner? (IAW 265.172)	✓ Yes ___ No
		If no, explain in narrative.	
___	5.	Are the stored containers closed?	✓ Yes ___ No
		If no, explain in narrative.	
___	6.	Are containers holding hazardous waste opened, handled, or stored in such a manner as to cause the container to rupture or leak? (IAW 265.173)	___ Yes ✓ No
		If yes, explain in narrative.	
✓	7.	Are areas where containers are stored inspected at least weekly looking for container leaks and for deterioration caused by corrosion or other factors? (IAW 265.173)	___ Yes ✓ No
___	8.	Are containers holding ignitible or reactive wastes located at least 15 meters (150 feet) from the facility property line? (IAW 265.176)	✓ Yes ___ No
___	9.	Are incompatible wastes stored in the same containers or placed in an unwashed container that previously contained an incompatible waste or material? (IAW 265.177)	___ Yes ✓ No
		If yes, explain in narrative.	
___	10.	Are containers holding incompatible wastes kept apart by physical barrier or sufficient distance? (IAW 265.177)	✓ Yes ___ NO
		If no, explain in narrative.	

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Containers
Checklist Narrative

item

x 7. The container storage area is not inspected on a regular basis for signs of leaks or deterioration. The start of accumulation date has not been marked on each container.

FACILITY Gulfstream

DATE: 7/11/86

TANKS CHECKLIST
(Rule 7.9 & 7.1.6.)

Area of
N/C

NOTE: If multiple tanks exist, list each tank and specify compliance or non-compliance. Complete an individual checklist for each tank not in compliance and collective checklist for those in compliance.

1. Are there any tanks which are not being used which the facility no longer plans to use? ____YES ✓NO

   a. If yes, has all hazardous waste and hazardous waste residue been removed from these tanks, discharge control equipment, and discharge confinement structures? NA YES ____NO

2. Are tanks presently used to treat or store waste? ✓YES ____NO

   a. If no, do not complete rest of form.
   b. If yes, check tanks.

3. Is there evidence that wastes placed in the tank are incompatible with the tank or liner? (IAW 265.192) ____YES ✓NO

   NOTE: Any evidence of ruptures, leaks or corrosion. (Use narrative explanations sheet.)

4. Are there any uncovered tanks? (IAW 265.192) ____YES ✓NO

   a. If no, do not complete 4b. -e.
   b. If yes, do they have 2 feet (60cm) freeboard? NA YES ____NO

   OR

   c. A containment structure? (e.g. dike or trench) ____YES ____NO

   OR

   d. A drainage control system? ____YES ____NO

   OR

   e. A diversion structure? (e.g. standby tank) ✓YES ____NO
   (NOTE: The structure in c, d or e must have a capacity that equals or exceeds the colume of the to 2 feet (60 cm) of the tank.

If the answers to 4b. -e. are "no", explain current conditions using narrative sheets.

Area of N/C

5. Are any of the tanks continous feed? (IAW 265.192) ____YES ✓NO

____ a. If yes, is it equipped with a means to stop inflow (e.g. waste feed cutoff or by-pass to a stand-by tank)? NA YES ____NO

Waste Analysis

6. Is the tank used to store one waste exclusively? ____YES ✓NO
(Use narrative explanations sheet). Variety of acid wastes HCl, HF, H_2SO_4, Chromic

____ 1. Are waste analyses and trail tests conducted on these wastes ____YES ✓NO

OR

Does the owner/operator have written documented information on similar treatment of similar wastes under similar operating conditions? & Experience ____YES ✓NO

____ 2. Is this information retained in the operating record? ____YES ✓NO

Inspections (Note: This section does not exclude underground tanks)

____ 7. Does the owner/operator inspect the following at least daily, where present? (IAW 265.194) NA YES ____NO

(Indicate which items are present in 7 and 8.)

____ a. Discharge control equipment (e.g. waste feed cut-off, by pass and/or drainage systems)? NA YES ____NO

____ b. Monitoring equipment (e.g. pressure and temperature gages)? NA YES ____NO

____ c. Level of waste in each uncovered tank? NA YES ____NO

____ 8. Does the owner/operator inspect the following at least weekly? (IAW 265.194) Not on any Log or Schedule ____YES ✓NO

a. Construction materials of tanks for corrosion or leaks? ✓YES ____NO
b. Construction materials of and area surrounding discharge confinement structures for erosion or signs of leakage? ✓YES ____NO

9. What is the procedure for assessing the condition of the tank(s)? Explain in narrative. (e.g. How does the procedure allow for detection of cracks, leaks or corrosion or procedures for emptying the tank to allow entrance, etc.) Observe for Rust, leaks, Seepage
Visual Observations by maintenance Dept

10. Does the facility have a closure plan? (IAW 265.197) ✓ YES ___ NO

___ a. Does the plan address the closure of each tank? If no, explain in narrative. ___ YES ✓ NO

___ b. Is the plan maintained at the facility ✓ YES ___ NO

11. Are ignitable or reactive wastes placed in tanks? (IAW 265.198) ___ YES ✓ NO

___ a. If yes, are they treated, rendered or mixed before or immediately after placement in the tank so it no longer meets the definition of ignitable or reactive? NA YES ___ NO

OR

___ b. Is the waste protected from sources of ignition or reaction? ✓ YES ___ NO

1. If yes, use narrative explanations sheet to describe separation and confinement procedures. by isolation + segregation

2. If no, use narrative explanations sheet to describe sources of ignition or reaction

OR

c. Is the tank used solely for emergencies? ___ YES ✓ NO

___ 12. Has the facility ever placed incompatible wastes in the tank? (IAW 265.199) ___ YES ✓ NO

a. If yes, what were the results. (Use narrative explanations sheet). (Look for signs of mixing of incompatible wastes, e.g. fire, toxic mist, heat generation, bulging containers, etc.

___ 13. If a waste is to be placed in a tank that previously held an imcompatible waste, was that tank washed? (IAW 265.199) NA YES ___ NO

a. If Yes, describe washing procedures (Use narrative explanation sheet).

b. Describe how it is possible for incompatible wastes to be placed in the same tank. (Use narrative explanations sheet.)

Gulf Stream 7/11/86

Tanks
Checklist Narrative

Item

x 6.0 Gulf Stream utilizes one storage tank for mixed acid waste. The tank holds approximately 5,000 gallons. Wastes stored in this tank include HCl, HF, H_2SO_4 and Chromic acids. The wastes are said to be hauled offsite to U.S.P.C.I. every 60-70 days however the start of accumulation date is not recorded.

6.1 Based on experience the operator has determined the wastes in the tank to be compatible. Testing is not necessary.

x 8.0 The operator stated that the tanks are inspected however no frequency is determined as inspection schedules and logs are not being maintained for the tank.

9.0 The maintenance department personnel are responsible for visually observing the tank for signs of rust, leaks, seepage etc. The tank appears to be in good condition.

x 10.a The facilities closure plan dated September 1982 does not address the closure of the tank.

11.b The tank is protected from sources of ignition or reaction by its placement on the property, isolated from such sources.

This checklist was filled out because the Generator was in violation of the 90 day Storage limitation.

FACILITY Gulfstream

DATE: 7-11-86

OKLAHOMA CONTROLLED INDUSTRIAL WASTE COMPLIANCE

INSPECTION REPORT - FACILITIES CHECKLIST

Area of N/C

Section A - General Facility Standards

____ 1. Does facility have EPA Identification No. and OSDH Site No? (Rule 7.1.6 IAW 40 CFR, 265.11) ____YES ✓ NO

____ A. If yes, OSDH Site No._____

____ EPA I.D. NO. OKT4100108821

If no, explain This facility notified as Generator Only - therefore was not given a site number

____ 2. Has facility received hazardous waste from a foreign source? (Rule 7.1.6.IAW 40 CFR 265.12) ____YES ✓ NO

A. If yes, has he filed a notice with the Director? NA YES ____NO

____ 3. Does owner/operator control precipation, run on and runoff that is or may become contaminated with industrial waste? (Rule 7.2.2) ✓ YES ____NO

____ A. Explain Berm around Storage tanks, Containers stored inside building

____ B. Is a containment structure used? Designed for less than 90 day storage NA YES ____NO

1. Is the structure capable of retaining precipitation and runoff generated by 24 hr.,hundred year storm plus a minimum of two (2) feet of freeboard. (Rule 7.2.2.2) NA YES ____NO

____ 4. Is all material handling conducted with in dikes, retention walls or other features to control all spills? Explain. (Rule 7.2.3) NA YES ____NO

A. Will the system contain the larger of

i. Volume of largest truck or rail cars loaded or unloaded

or

ii. 20% maximum total volume of all trucks and rail cars being loaded or unloaded at one time
plus
Precipitation and runoff generated by the 24Hr/50 year storm
plus
a minimum 12 in. of freeboard

7/11/86

Area of N/C

___ 5. Are all contained liquids handled as a controlled industrial waste? (Rule 7.2.3.1) ✓ YES ___ NO
Explain Should a tank, container etc leak it is handled as CIW

Waste Analysis

✓ 6. Does facility maintain a copy of the waste analysis plan at the facility (Rule 7.1.6, IAW 40 CFR 265.13) ___ YES ✓ NO

___ A. If yes, does it include NA

___ 1. Parameters for which each waste will be analyzed? ___ YES ___ NO

___ 2. Test methods used to test for these parameters? ___ YES ___ NO

___ 3. Sampling method used to obtain sample? ___ YES ___ NO

___ 4. Frequency with which the initial analyses will be reviewed or repeated? (For facilities receiving waste from off-site) ___ YES ___ NO

___ 5. Waste analyses that generators have agreed to supply? (For facilities receiving waste from off-site) ___ YES ___ NO

___ 6. Procedures which are used to inspect and analyze each movement of hazardous waste including:

a. Procedures to be used to determine the identity of each movement of waste? ___ YES ___ NO

b. Sampling method to be used to obtain representative sample of the waste to be identified? ___ YES ___ NO

7. Does the facility provide adequate security through: (Rule 7.3.1)

___ A. Fence around facility? (Rule 7.3.1) ✓ YES ___ NO

___ B. Locked entrance? (Rule 7.3.1) ✓ YES ___ NO

✓ C. Warning sign? (Rule 7.4.1) ___ YES ✓ NO

General Inspection Requirements

✓ (8.) A. Does the owner/operator maintain a written schedule for inspecting: (Rule 7.1.6 IAW 265.15 - General Inspection Requirements)

___ 1. Monitoring equipment? (If applicable) NA YES ___ NO

Area of N/C

____	2. Safety and emergency equipment?	____YES	✓ NO
____	3. Security devices?	____YES	✓ NO
____	4. Operating and structural equipment (if applicable)	NA YES	____NO
____	5. Does the schedule or plan identify the types of problems to be looked for during inspection?	____YES	✓ NO
____	a. Malfunction or deterioration (e.g. inoperative sump pump, leaking fitting, eroding dike, corroded piper or tanks, etc.)	____YES	✓ NO
____	b. Operator error	____YES	✓ NO
____	c. Discharges (e.g. leaks from valves or pipes joint breaks, etc.)	____YES	✓ NO
____	B. Is a written schedule for these inspections maintained at the facility?	____YES	✓ NO
____	1. Are these inspections conducted?	____YES	✓ NO
	a. Is a record of these inspections maintained in the inspection log?	____YES	✓ NO
✓	(9) Does the owner/operator have an inspection log? (Rule 7.1.6 IAW 265.15 - General Inspection Requirements)	____YES	✓ NO
____	A. If yes, does it include:		
____	1. Date and time of inspection?	NA YES	____NO
____	2. Name of inspector?	____YES	____NO
____	3. Notation of observations?	____YES	____NO
____	4. Date and nature of repairs or remedial action?	____YES	____NO
____	B. Are there any malfunctions or other deficiencies noted in the inspection log that remain uncorrected? (Use narrative explanation sheet).	____YES	____NO
____	C. Are records of the inspection log maintained at the facility for three (3) years?	____YES	____NO

Personnel Training *see generator Only Checklist*

✓	(10) Does the owner/operator maintain Personnel Training Records at the facility? (Rule 7.1.6 IAW 40 CFR 265.16)	____YES	✓ NO

How long are they kept? _____

A. If yes, do they include:

Area of N/C

____	1.	Job title and written job description of each position?	NA ____YES	____NO
____	2.	Description of type and amount of training?	____YES	____NO
____	3.	Records of training given to facility personnel?	____YES	____NO
____	4.	Is training reviewed annually?	____YES	____NO

Requirements for Ignitable, Reactive or Incompatible Waste

11. Does facility handle ignitable or reactive wastes? (Rule 7.1.6 IAW 40 CFR 265.17) ✓ YES ____NO

____ A. If yes, is waste separated and confined from sources of ignition or reaction, (open flames, smoking, cutting and welding, hot surfaces, frictional heat) sparks (static, electrical or mechanical), spontaneous ignition (e.g. from heat producing chemical reactions) and radiant heat? ✓ YES ____NO

1. If yes, ~~use narrative explanations sheet to~~ describe separation and confinement procedures. No Smoking Area + Segregated from ignition sources
2. If no, use narrative explanation sheet to describe sources of ignition or reaction.

____ B. Are smoking and open flame confined to specifically designated locations? ✓ YES ____NO

____ C. Are "No Smoking" signs posted in hazardous areas? ✓ YES ____NO

____ 12 Check Containers (Rule 7.8 & 7.1.6, IAW 40 CFR 265.17)

____ A. Are containers leaking or corroding? ____YES ✓ NO

____ B. Is there evidence of heat generation from incompatible wastes? ____YES ✓ NO

Section B - Preparedness and Prevention

✓ 1. Is there evidence of fire, explosion or contamination of the environment? (Rule 7.1.6 IAW 40 CFR 265.31) ✓ YES ____NO

If yes, use narrative explanations sheet to explain.: See Generator Only Narrative Section B.1

2. Is the facility equipped with: (Rule 7.1.6 IAW 40 CFR 265.32)

____ A. Internal communication or alarm system? ✓ YES ____NO

____ (1) Is it easily accessible in case of emergency? ✓ YES ____NO

Area of N/C

___ B. Telephone or two-way radio to call emergency response personnel? ✓ YES ___ NO

___ C. Portable fire extinguishers, fire control equipment, spill control equipment and decontamination equipment? ✓ YES ___ NO

___ (1) Is this equipment tested to assure its proper operation? ✓ YES ___ NO

___ D. Water of adequate volume for hoses, sprinklers or water spray system? ✓ YES ___ NO

(1) Describe source of water City Supply

___ 3. Is there sufficient aisle space to allow unobstructed movement of personnel and equipment? (Rule 7.1.6, IAW 40 CFR 265.35) ✓ YES ___ NO

✓ 4. Has the owner/operator made arrangements with the local authorities to familiarize them with characteristics of the facility? (layout of facility, properties of hazardous waste handled and associated hazards, places where facility personnel would normally be working, entrances to roads inside facility, possible evacuation routes). (Rule 7.1.6 IAW 40 CFR 265.37) Need to provide Contingency Plan has made verbal contact only ___ YES ✓ NO

___ 5. In the case that more than one police and fire department might respond, is there a designated primary authority? (Rule 7.1.6, IAW 40 CFR 265.37) ✓ YES ___ NO

a. If yes, list primary authority Fire = Wiley Post Airport
Police = City of Bethany

___ 6. Does the owner/operator have phone numbers of, and agreements with, State emergency response teams, emergency response contractors and equipment suppliers? (Rule 7.1.6, IAW 40 CFR 26.537) ✓ YES ___ NO

___ Are they readily available to emergency coordinator? ✓ YES ___ NO

___ 7. Has the owner/operator arranged to familiarize local hospitals with the properties of hazardous waste handled and types of injuries that could result from fires, explosions, or releases at the facility? (Rule 7.1.6, IAW 40 CFR 26.537) ✓ YES ___ NO

Section C - Contingency Plan and Emergency Procedures
(See Generator Only Narrative Section C)

___ 1. Is a contingency plan maintained at the facility? (Rule 7.1.6, IAW 40 CFR 265.51 & 53) ✓ YES ___ NO

___ A. 1. If yes, is it a revised SPCC Plan? (Rule 7.1.6, IAW 40 CFR 265.52) ___ YES ✓ NO

Area of N/C

____	2. Actions to be taken in response to emergencies?	✓ YES	____ NO
____	3. Description of arrangements with police, fire and hospital officials?	✓ YES	____ NO
✓	4. List of names, addresses, phone numbers of persons qualified to act as emergency coordinator?	____ YES	✓ NO
✓	5. List of all emergency equipment at the facility?	____ YES	✓ NO
✓	6. Evacuation plan for facility personnel?	____ YES	✓ NO
____	2. Is there a emergency coordinator on site, or within short driving distance, at all times? (Rule 7.1.6, IAW 40 CFR 265.55)	✓ YES	____ NO

Section D - Manifest System, Recordkeeping and Reporting

	1. Does facility receive waste from off-site? (Rule 1.3.1.6)	____ YES	✓ NO
____	A. If yes, does the owner/operator retain copies of all manifests?	NA ____ YES	____ NO
	(1) Are the manifests signed and dated and returned to generator?	____ YES	____ NO
	(2) Is a signed copy given to the transporter?	____ YES	____ NO
✓	2. Does the owner/operator keep a written operating record at the facility? (Rule 7.1.6 IAW 265.73)	____ YES	✓ NO
____	A. If yes, does it include:		
____	(1) Description and quantity of each hazardous waste received?	NA ____ YES	____ NO
____	(2) Location and quantity of each hazardous waste at each location?	____ YES	____ NO
____	(3) Records and results of waste analyses?	____ YES	____ NO
____	(4) Report of incidents involving implementing of the contingency plan?	____ YES	____ NO
____	(5) Records and results of required inspections?	____ YES	____ NO
____	(6) Monitoring, testing or analytical date?	____ YES	____ NO

Area of
N/C

NA

____ (7) Closure cost estimates and for disposal facilities post closure cost estimates? ____YES ____NO

____ (8) Is location of waste recorded on map or diagram? ____YES ____NO

____ 3. Has the facility received any waste (that does not come under the small generator exclusion) not accompanied by a manifest? NA YES ____NO

____ A. If yes, has he submitted an unmanifested waste report to the Director (Rule 7.1.6, IAW 265.76) ____YES ____NO

4. Has the facility received any shipments of controlled industrial waste which were inconsistent with the manifest? (Rule 7.1.6 IAW, 265.72) ____YES ____NO

____ A. If yes, has he resolved the discrepancy with generator & transporter? ____YES ____NO

____ B. If no, has a manifest discrepancy report been filed with the Director? ____YES ____NO

Section E. - Plans and Reports

____ 1. Have all plans and reports been visually inspected and/or been made available for inspection? (Rule 7.1.6 IAW 265.74- availability, retention and disposition of records) ✓ YES ____NO

A. Does the facility submit monthly reports to the Director? ____YES ✓ NO
List discrepancies or errors As Generator submits quarterly reports

B. Does the facility submit annual reports that include closure cost estimates and, where applicable, monitoring data. ____YES ✓ NO
List discrepancies or errors Closure cost est. not revised annually

____ List plans and/or reports not made available for inspection.

Personnel Training Records

____ 2. Did operator provide inspector with a drawing of the facility? ✓ YES ____NO

a. If yes, please indicate which are hazardous waste facilities on the drawing. Attachment

3. Indicate types of hazardous waste facilities.

✓ Containers
✓ Tanks
____ Surface Impoundments

Area of
N/C

_____Waste Piles
_____Land Treatment
_____Landfill
_____Incinerator
_____Thermal Treatment
_____Chemical, Physical and Biological Treatment

_____ Section F - Groundwater Monitoring

_____ 1. Are there any ground water monitoring wells? _____YES ✓ NO
(Rule 7.1.6 , 265.90 Applicability)

NA

a. Is owner/operator aware that prior to 11/19/81 he must install, operate and maintain a groundwater monitoring system (unless waived in writing)? _____YES _____NO

The owner or operator of a surface impoundment, landfill, or land treatment facility which is used to management hazardous waste must implement a groundwater monitoring program. (Rule 7.1.6, IAW 265.90)

_____ 1. Specify the site(s) for which a ground water monitoring system (has) or (should have) been installed: _____

_____

_____ 2. What date was the monitoring program initiated (date of first sampling)? _____

_____

_____ 3. Indicate by a map or sketch locations of each monitoring well and distance from active site(s) (attach). Also list depths diameter and completion data on each well (or include well drilling and completion report). Indicate whether the wells are hydraulically upgradient or downgradient and the direction of flow of the groundwater. (Rule 7.1.6 IAW 265.91)

_____ 4. If no ground water monitoring system has been installed, include a copy of Low Potential Ground Water Demonstration used to document a low potential for migration of hazardous waste or constituents. Also describe briefly what basis was used to justify the waiver of monitoring requirements: (Rule 7.1.6 IAW 265.190 (c))

_____

_____

_____

_____ 5. If a ground water monitoring system has been installed, attach a copy of the ground water sampling and analysis plan. Briefly describe sample collection technique for obtaining samples and the method used to establish elevation of ground water for ground water monitoring wells: (Rule 7.1.6 IAW 265.92)

_____

_____

Gulfstream 7/11/86

Facilities
Checklist Narrative

Item

This Checklist was filled out because the 90 day storage time limitation was exceeded by the generator. The facility was not listed as a TSD and only notified as a generator.

A 6.0 The facility does not utilize a waste analysis plan. This is required for TSD facilities

A 7.C The Warning Signs for TSD facilities are non-existent

A 8.0 The Facility does not maitain an inspection schedule and does not perform routine inspections.

A 9.0 NO inspection logs are utilized or records kept.

A 10.0 There are no personnel training records

B 4.0/C See generator only narrative the contingency plan is incomplete and copies have not been revised and provided to local authorities

D 2.0 As required for TSD facilities Gulfstream does not keep a written operating record at the facility.

G. 2. A There is a closure plan but it does not address the tank at all or decontamination steps. Page 3 of the closure plan states that the Southern storage area may have waste stored in excess of 90 days this should be reworded to not in excess of 90 days. The Closure Plan and and Contingency Plan were written for Gulfstream

Facilities Checklist Narrative Cont

by Stanley/Wynne Engineering in 1982. Both plans are inadequate and have been ignored by facility personnel in that their existence was not known to key personnel and filed away rather than actively updated and followed.

H. Gulfstream has not met the financial requirements of a TSD. There is a closure cost estimate but it does not address tank closure and has not been revised annualy.

Area of
N/C

NA

____ 6. Is a Ground Water Quality Assessment Plan maintained at the facility?

YES ____ NO ____ Outline only _____

7. Indicate the name and address of the facility conducting the analyses.

_____

Section G - Closure and Post Closure (Rule 7.1.6)

1. Attach copy of closure plan. See Board Copy #82

____ 2. Does owner/operator maintain copy of closure plan at facility? ✓ YES ____ NO
(IAW 265.112)

If yes;

✓ (A.) Does Closure Plan Include: Closure plan does not address Tank Storage area only containers

____ 1. Description of steps to close facility. ✓ YES ____ NO
____ 2. Estimate of maximum inventory of wastes at facility ✓ YES ____ NO
____ 3. List steps needed to decontaminate equipment. ____ YES ✓ NO
____ 4. Expected year of closure and schedule of closure. ✓ YES ____ NO

____ B. Does Post Closure Plan provide for thirty (30) years. (IAW 265.117)

NA

____ 1. Monitoring Activities. ____ YES ____ NO
____ 2. Maintenance of monitoring and containment systems. ____ YES ____ NO
____ 3. Has land authority been notified of waste disposal? (IAW 265.119) ____ YES ____ NO
____ 4. Does deed contain notice that property was used for waste disposal? (IAW 265.120) ____ YES ____ NO

✓ Section H - Financial Requirements (Rule 7.1.9)

NA if Generator only

____ 1. List instrument of financial responsibility.

____ 2. Is there a cost estimate for closure? (IAW 265.142) ✓ YES ____ NO

____ 3. Is there financial assurance for closure? (IAW 265.143) ____ YES ✓ NO

____ 4. Is there a cost estimate for post-closure? (IAW 265.144) ____ YES ✓ NO

HAZARDOUS WASTE AND MATERIAL STORAGE:

DEFINITION OF HAZARDOUS WASTE - For the purposes of this plan, hazardous waste is defined as solid or liquid waste which, because of quantity, concentration, physical, or chemical characteristics, may pose a substantial present or potential hazard to the public or environmental health.

STORAGE ACTIVITIES - Hazardous waste that remains on site in excess of 90 days as defined in 40 CFR 265, are located in a single designated area. Wastes are stored in 55 gallon drums on a bermed concrete floor. See Appendix A for site plan drawing.

DESCRIPTION - The hazardous waste storage area is approximately 750 square feet in size. It is located at the southern end of the plant for the purpose of storing a variety of hazardous waste awaiting disposal or reclamation.

DEFINITION OF HAZARDOUS MATERIALS - For the purposes of this plan, hazardous materials will be defined as any material that, if discarded, would be defined as a hazardous waste.

BARREL HOUSE - A large amount of the chemicals used in the manufacturing process are stored in 55 gallon drums in the 20 X 40 back section of the flammable storage area. Approximately 3,500 gallons of a variety of chemicals are stored year around. These chemicals include triclorethylene, methyl ethyl ketone, liquid smut, deoxidizer, lubricants, and other chemicals. For further barrel house information, see Appendix B.

PAINT STORAGE AREA - The paint area is a 40 X 40 area that shares a common wall with the barrel house operation. Stored are large quantities of paint thinner, paints, primar, battery acid, styrene, toluene, sodium, silicate, and rubber cement. For detailed information, see Appendix B.

HAZARDOUS WASTE AND MATERIAL SPILL CONTROL - Major spill potential for hazardous waste storage area, barrel house, and the paint storage areas are limited since most storage is in 55 gallon drums or smaller containers. Small spills will be removed with an absorbant broom and disposed of properly. Large spills will be removed with the plant's mobil vacuum unit and will also be disposed of in an appropriate manner. In both cases, residue remaining on the floor will be retrieved using an absorbant material. Shovels will be used to place residue in plastic bags which will be sealed and retained for proper disposal.

HAZARDOUS MATERIAL USAGE:

GENERAL - Chemical usage throughout the factory in various operations results in the generation of waste chemicals, and due to the quantities on hand in the facility posses a potential for hazardous waste spills.

PROCESS AREA - The process area consists mainly of a number of dip tanks for treating small airplant parts prior to apinting. Metal parts are dipped into hydro-fluoric acid, alkaline cleaner, sodium bi-cromate, cromate, nitric acid, an acidic deoxidizer, desmuter, cromic acid, and cadmium plating. For an inventory of process chemicals, see Appendix B. Approximately 12,000 gallons are stored in tanks of different sizes.

Spill Control - The largest potential for spills in this area would be rupturing of storage tanks. Any spills in the process area would be held by large open containjment basins in the floor surrounding the tanks. These basins would be vacuumed to remove spilled material and remaining residue would be removed with an absorbant drying material. All spilled chemicals would be properly disposed.

TOOLING AREA - Outside the tooling area, a variety of chemicals are stored and used on a bermed concrete pad. These chemicals include petroleum distallates, hydrofluoric acid, sulfuric acid, oil, and deoxidizers. The area is approximately 80 square feet in size and contains roughly 1,400 gallons of chemicals.

Spill Control - Valves on all drums are spring loaded to reduce spillage. The material from any drums that might rupture would be removed with a combination of vacuum, absorbant broom, and a drying material. All spilled material will be disposed of in an appropriate manner.

FIBERGLASS AREA - Hazardous materials used in the fiberglass area are limited to resins which contain small quantities of styrene. One 55 gallon drum is used at a time and resin is directly withdrawn from the drum.

Spill Control - Any spills would be minor in nature and would be removed with an absorbant broom and absorbant drying materials. Captured materials would then be properly disposed.

SPRAY PAINTING OPERATIONS - Spray painting occurs in the paint hanger and process area of the plant. See site plan for specific locations. Water wash ventilation systems are used in both areas to exhaust paint overspray and volitiles. Zinc-cromate based paint is used in the process area. Conventional paints are used in the spray painting hanger.

Spill Control - The wastewater is removed from the water wash booths every three months by an outside contractor and properly disposed. Spill potential is limited to days when the booths are emptied. Clean up crews will be immediately available to visually inspect waste removal operations and respond to a spill situation.

WASTE DISPOSAL ACTIVITIES:

STORAGE AREA - Hazardous wastes awaiting disposal or reclammation are accumulated in 55 gallon drums and stored in the waste storage area. Drums are segregated and stored in appropriate locations within the facility. The contents of the drums are carefully inventoried, documented, and dated. When drums are accumulated in sufficient quantities for either disposal or reclammation, they are removed from the site and properly disposed by an outside contractor.

EVACUATION PLAN:

Evacuation plans will be initiated and their extent determined by the emergency coordinator. The signal to begin evacuation will be given over the company loud speaker. This will be followed by voice orders over the loud speaker and orders from area supervisors directing the evacuation. The all clear directive will be followed by voice orders over the loud speaker and by directions of evacuation guides.

All employees in the effected area will be directed to a safe area of the plant. Fire, explosion, and disaster procedures presently in practice at Gulfstream American will determine primary and alternative evacuation routes.

DESCRIPTION OF OUTFALLS:

Waste water from the Gulfstream Plant consists of both contact and non-contact process water and discharges into the Bethany municipal sanitary sewer system, ultimately being discharged into the North Canadian River, after treatment.

Storm water run-off from rooftops, parking lots, and driveways exits the Gulfstream Facility in several locations where municipal streets and stormwater drainage systems collect and carry the run off to the west of the plant site.

Reference 2

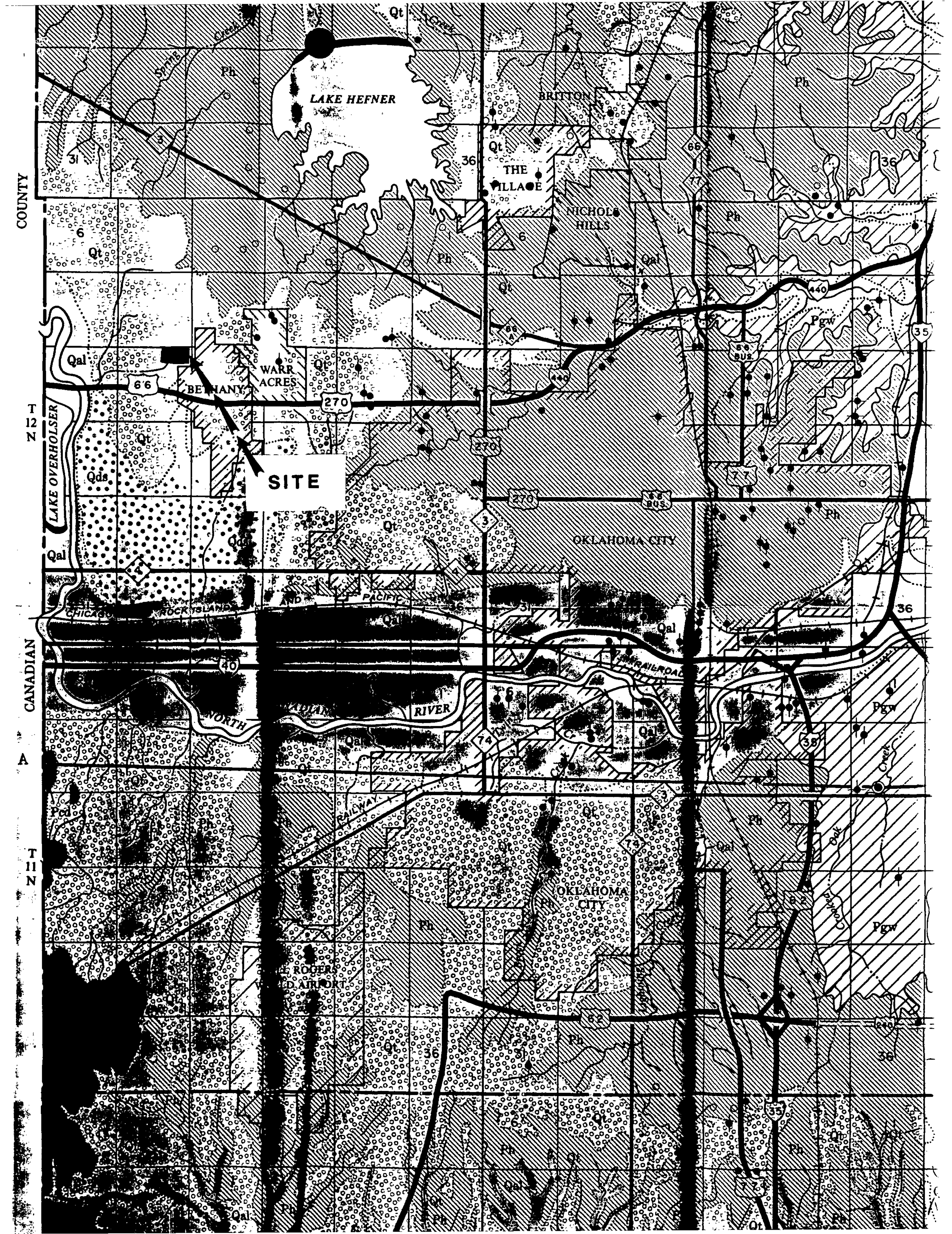
OKLAHOMA
GEOLOGICAL
SURVEY

CIRCULAR 71

Ground-Water Resources Cleveland and Oklahoma Counties

P. R. WOOD
and
L. C. BURTON

1968



LAKE HEFNER
BRITTON
THE VILLAGE
NICHOLS HILLS
WARR ACRES
BETHANY
SITE
OKLAHOMA CITY
LAKE OVERHOLSER
CHICAGO ROCK ISLAND AND PACIFIC
RAILROAD
NORTH CANADIAN RIVER
WILL ROGERS WORLD AIRPORT
COUNTY
CANADIAN
T 12 N
T 11 N
Ph
Qt
Qal
Qds
Pgw
Pcd

use.)

site

Pleistocene

TERRACE DEPOSITS

(Gravel, sand, silt, and clay in and along the Canadian River and North Canadian River valleys; moderately permeable; yields small to moderate quantities of water to wells. Water quality suitable for most uses but may require softening for some purposes.)

PERMIAN

Lower Permian

Pc

CHICKASHA FORMATION
AND
DUNCAN SANDSTONE

(Reddish-brown sandstone, siltstone, shale, and siltstone conglomerate; poorly permeable; yields small quantities of water to wells. Water is hard and in some places highly mineralized.)

Ph

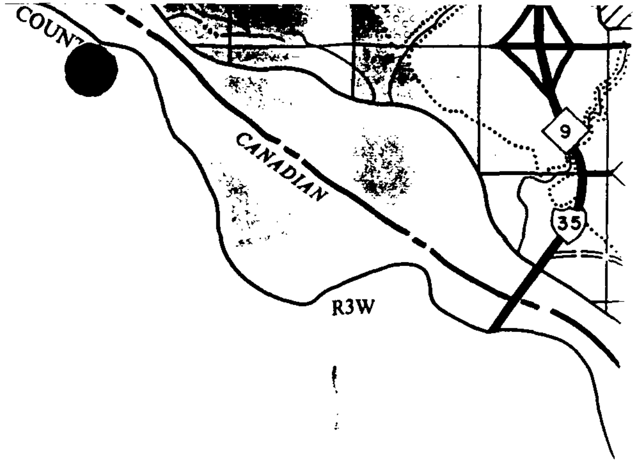
HENNESSEY SHALE

(Deep-red clay shale containing thin beds of sandstone and white or greenish bands of sandy or calcareous shale; poorly permeable; yields small quantities of hard, highly mineralized water to wells.)

Pgw

GARBER SANDSTONE
AND
WELLINGTON FORMATION

(Deep-red to reddish-orange, massive and cross-bedded, fine-grained sandstone interbedded and interfingered with lenticular masses of red or gray shale; poorly to moderately permeable; yields moderate quantities of water to deep wells in western parts of Cleveland and Oklahoma Counties. Water from shallow wells hard to very hard; water from deep wells soft to moderately hard.)



Geology by C. L. Jacobsen, 1943-1944, . Burton, 1953-1957. Base compiled from logical Survey topographic maps, U. S. D of Agriculture aerial photographs, and Department of Highways maps.

HYDROLOGIC CONTROL POINTS

Domestic, stock, or unused well

Public supply or institutional well

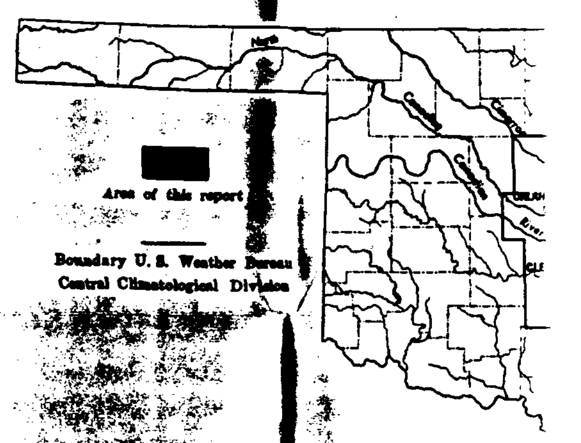
Industrial well

Irrigation well

Test hole

A

Electric-log cross section (see figure 3 in text)



Index map

77

U. S. highway

Interstate highway

9

State highway

Paved road

Proposed road

Railroad

The Chickasha and Duncan are poorly permeable and have little value as an aquifer in Cleveland and Oklahoma Counties. They are tapped by only a few small-capacity wells for domestic and stock use. In general, the water is suitable for human consumption but, in some places, contains too much dissolved gypsum or is otherwise too highly mineralized even for stock use.

Quaternary Deposits

The Quaternary deposits of Cleveland and Oklahoma Counties include terrace deposits at one or more levels in, or adjacent to, the valleys of the Canadian and North Canadian Rivers, alluvium in the valleys of the principal streams, and dune sand. The areal distribution of the deposits is shown on the geologic map (pl. I), and their lithologic character and general hydrologic properties are summarized in table 2.

The Quaternary deposits supply ground water for rural, domestic, and stock purposes at many places in the two counties, and they are the source of most of the ground water used to satisfy the water needs of several small towns and unincorporated communities in the valleys of the Canadian and North Canadian Rivers. However, except for two areas along the Canadian River near Norman and an area along the North Canadian River between Oklahoma City and Lake Overholser, they have not been studied in detail.

The terrace deposits and dune sand overlie the Permian rocks and, because of their relatively high permeability, facilitate the recharge of the underlying rocks. Because the Quaternary deposits are more permeable than the Permian redbeds, springs, seeps, or "wet-weather springs" occur where the contact between the two is exposed in low areas. The alluvium generally fills valleys cut 20 to 100 or more feet below the uplands. Because of this topographic relationship, the alluvium receives some seepage from sandy units or fractured zones in the bedrock. This seepage helps to maintain a high water table in the alluvium. Water in the alluvium is discharged principally by evaporation and transpiration, but some moves downstream in the alluvial deposits, and some seeps into the stream channels to maintain flow in dry seasons.

TERRACE DEPOSITS

Terrace deposits consist of materials laid down by ancient streams, which, since the time of deposition, have cut valleys to lower levels. In Cleveland and Oklahoma Counties, the streams that made the deposits were ancestors of the Canadian and North Canadian Rivers. The deposits consist mostly of lenticular beds of sand, silt, clay, and gravel, which vary greatly in thickness within short lateral distances. Where they have sufficient saturated thickness, the terrace deposits yield larger quantities of water of lower mineralization than that in the Permian rocks, and, on the whole, water of

better quality than that in the alluvium. Replenishment of ground water in the terrace deposits comes mainly from infiltration of precipitation that falls on the terrace surface.

The terrace deposit on the upland between Lake Overholser and Lake Hefner (pl. I), known locally as the Bethany terrace, is the source of the ground water pumped by the city of Bethany (Jacobsen and Reed, 1949). The deposit also supplies water to many shallow wells used for residential gardening in Bethany, Warr Acres, and adjoining parts of Oklahoma City.

Logs of test holes drilled for the Bethany and Oklahoma City Water Departments indicate that the terrace deposit has a maximum thickness of about 80 feet and that it is thickest over a buried stream channel that curves southward through the central part of sec. 6, SW¼ sec. 5, western part of sec. 8, and SE¼ sec. 7, T. 12 N., R. 4 W. (L. C. Burton, written communication, 1958). Elsewhere, the deposits of the Bethany terrace vary greatly in thickness over short lateral distances, according to the configuration of the buried bedrock surface (Hennessey Shale) and the amount of terrace material removed by erosion.

The depth to water generally is less than 30 feet below land surface. The yields of wells tapping the terrace deposits are not known, but it is likely that, where the saturated thickness is at least 5 feet, properly spaced wells would yield 5 to 10 gpm. Where the saturated thickness is more than 50 feet, properly spaced and developed wells should be capable of sustained yields of 100 to more than 200 gpm.

Other terrace deposits that occur in Oklahoma County, as shown on plate I, have not been studied by the U. S. Geological Survey and are not known to have been tested as a source of ground water for large-capacity wells; hence, their ground-water potential is not known.

Terrace deposits also were mapped along the upland bordering the Canadian River in Cleveland County. However, except for an area near Norman (Stacy, 1961), the deposits have not been studied by the U. S. Geological Survey and their ground-water potential is little known.

According to Stacy (1961), the terrace deposits in the vicinity of Norman contain considerable quantities of water of good quality at depths generally less than 50 feet below land surface. The logs of test holes indicate that the deposits range from 40 to 95 feet in thickness and that their saturated thickness averages 40 feet. At favorable sites, wells that are properly constructed and developed should be capable of producing as much as 200 gpm.

ALLUVIUM

The modern channels, flood plains, and low terraces along the Canadian, North Canadian, and Little Rivers and their major tribu-

			and interfingered with red shale and siltstone.
Wellington Formation	500±	Deep-red to reddish-orange massive and cross-bedded fine-grained sandstone irregularly interbedded with red, purple, maroon, and gray shale. Base of formation not exposed in the area.	Oklahoma Counties. Yields small to moderate quantities of water to deep wells; heavily pumped for industrial and municipal uses in the Norman and Midwest City areas. Water from shallow wells hard to very hard; water from deep wells moderately hard to soft. Lower part contains water too salty for domestic and most industrial uses.

HYDROLOGY OF THE GARBER SANDSTONE AND WELLINGTON FORMATION

The Garber Sandstone and Wellington Formation constitute the most important source of ground water in Cleveland and Oklahoma Counties. The cities of Edmond, Nichols Hills, Del City, Midwest City, Moore, and Norman, and many small towns obtain all their water supplies from wells completed in one or both of the formations.* Tinker Air Force Base, a major service facility in the national-defense establishment, The University of Oklahoma, Central State Griffin Memorial Hospital, and many commercial and industrial firms also obtain their water supplies from wells tapping one or both formations. Oklahoma City and several commercial and industrial establishments in the city have wells in one or both formations. Since the 1951-1956 drought, the Oklahoma City wells and many of the commercial wells have been little used, but they are maintained on a standby basis.

The Garber and Wellington constitute a single aquifer, or water-bearing zone. The two formations were deposited under similar conditions, and both consist of lenticular beds of sandstone, siltstone, and shale that may vary greatly in thickness within short lateral distances. Wells drilled into the water-bearing zone may tap individual beds of sandstone as much as 50 feet thick and may penetrate as much as 200 to 300 feet of water-bearing sandstone. Other wells drilled nearby may tap only a few relatively thin beds of sandstone and may penetrate less than 100 feet of water-bearing material.

Thickness of the Fresh-Water Zone

Wells obtain fresh water from the Garber and Wellington at depths of 100 feet or less in the areas of outcrop and at maximum depths of about 1,000 feet in the structural depression in the Midwest City area. The maximum depth at which wells obtain potable water supplies is controlled by the depth at which salt water is encountered in these formations (fig. 4). The contact between the fresh water and salt water probably is not abrupt because an intermediate brackish-water zone has been found in some wells. Where such brackish water is encountered, the wells commonly are plugged back and completed in a higher water-bearing zone.

The approximate depths below land surface of the base of the fresh-water body in different parts of the area are as follows: near

* Since completion of this report, the Lake Thunderbird reservoir has been completed, and Norman now derives all public water supplies from this source, maintaining the old wells on a standby basis. Del City and Midwest City fulfill their needs from both the reservoir and wells.

Canadian River in southeastern Cleveland County, 100 feet; Noble, 400 feet; Norman, 700 feet; Moore, 850 feet; southwest corner Oklahoma County, 1,000 feet; Harrah, 300 feet; Choctaw, 640 feet; Midwest City, 1,000 feet; Oklahoma City-Lake Hefner area, 800 feet; Edmond, 700 feet; and Luther, 200 feet.

Figure 4 is a contour map of the base of the fresh-water body. The base was determined from electric logs of oil and gas wells, drillers' logs, and chemical analyses of water samples obtained from water wells. The bottom of the lowermost fresh-water sandstone at any location was assumed to be the base of the fresh-water section. However, if that sandstone grades laterally into shale, the next higher sandstone that would have been chosen as the base of the fresh-water body in an adjacent well may be several tens of feet higher.

In general, the base of the fresh-water body in the two counties has the shape of an elongate westward-tilted trough, trending slightly west of north and parallel to the regional strike of the geologic formations. In most places the base of the fresh-water body dips westward at rates ranging from 10 to 20 feet per mile. The steep rise, or gradient, which extends northward along the west side of the two counties from a point near Norman, probably represents the limit to which salt water has been flushed from individual sandstone beds in the Garber Sandstone and Wellington Formation. Although the contact between fresh and salt water is represented as a sharply defined one, there is probably a transition zone in which fresh water gradually grades into salt water.

The contours on the base of the fresh-water body reflect some structural features in the Garber and Wellington. Thus, the greatest depth of fresh water corresponds to the Midwest City depression and the shallower depth of fresh water southeast of Oklahoma City corresponds to the Oklahoma City anticline. However, the steep rise in the slope of the contact between the fresh water and the salt water at the west edge of the map is unrelated to rock structure and may reflect a change of facies from coarser to finer sediments.

Two cross sections (figs. 5, 6) illustrate the lensing and interfingering of sandstone, shale, and silty beds in short lateral distances and show the approximate base of the fresh-water body as determined from figure 4. Section A-A′ (fig. 5) is a small-scale electric-log section drawn from east to west across the Oklahoma City area, following roughly the direction of dip. The section shows the lenticular character of the individual beds and lithologic units that makes it difficult or impossible to correlate such units from well to well. However, the approximate base of the fresh-water body is indicated on the section.

Section B-B′ (fig. 6) is a detailed lithologic section based upon

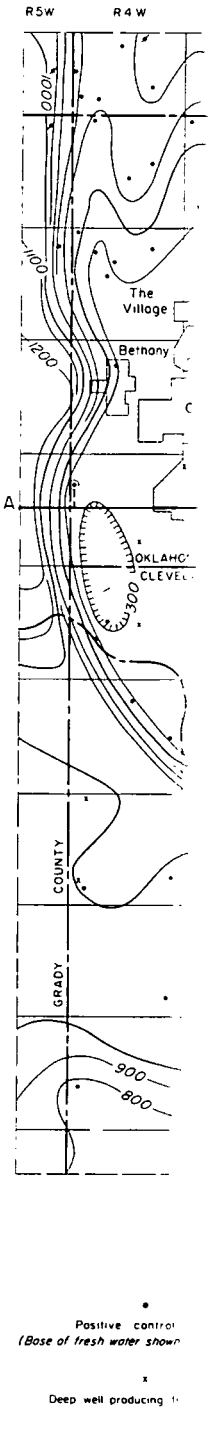
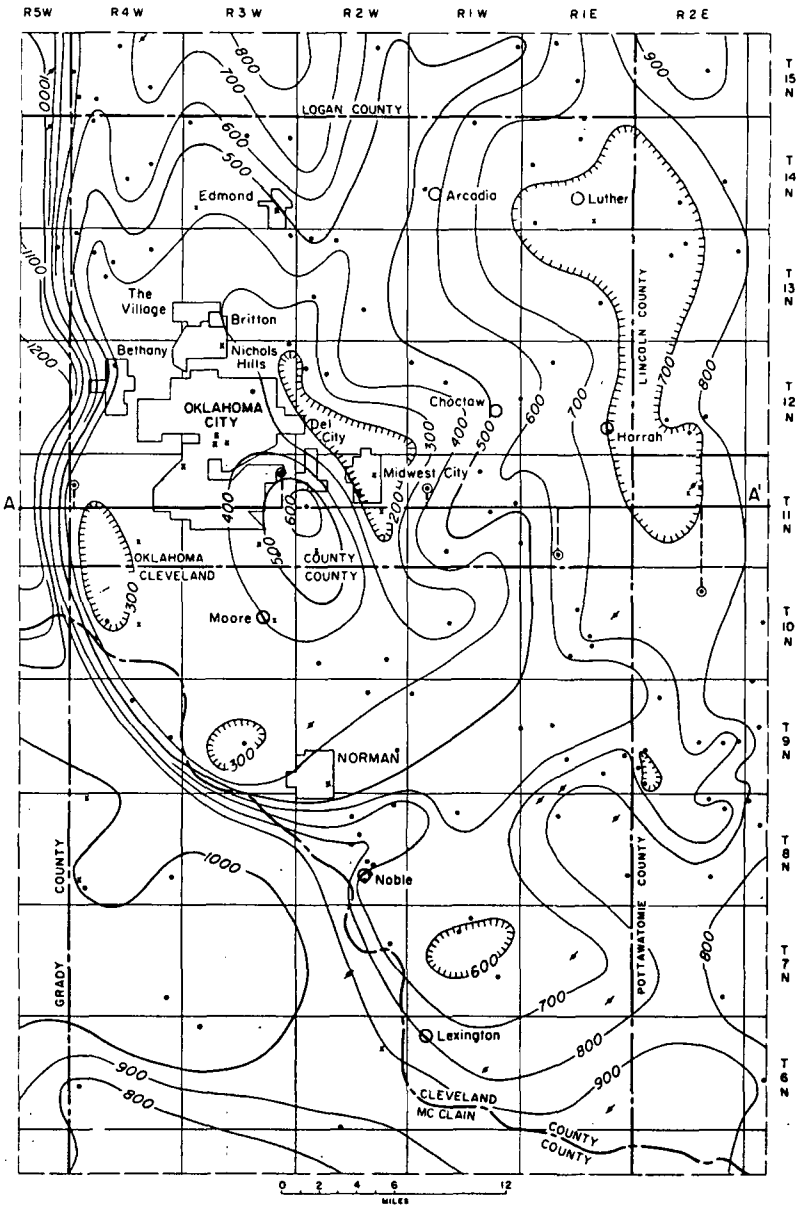


Figure 4. Map showing the base of fresh ground water in Cleveland and Oklahoma Counties. Cross section A-A′ is shown in figure 5.



700

Contour on base of fresh-water zone
(Interval: 100 feet; datum: mean sea level)

Positive control point
(Base of fresh water shown on electric log)

Negative control point
(Base of fresh water above interval shown on electric log)

Deep well producing fresh water

Well shown on electric-log section A-A'
(see fig. 5)

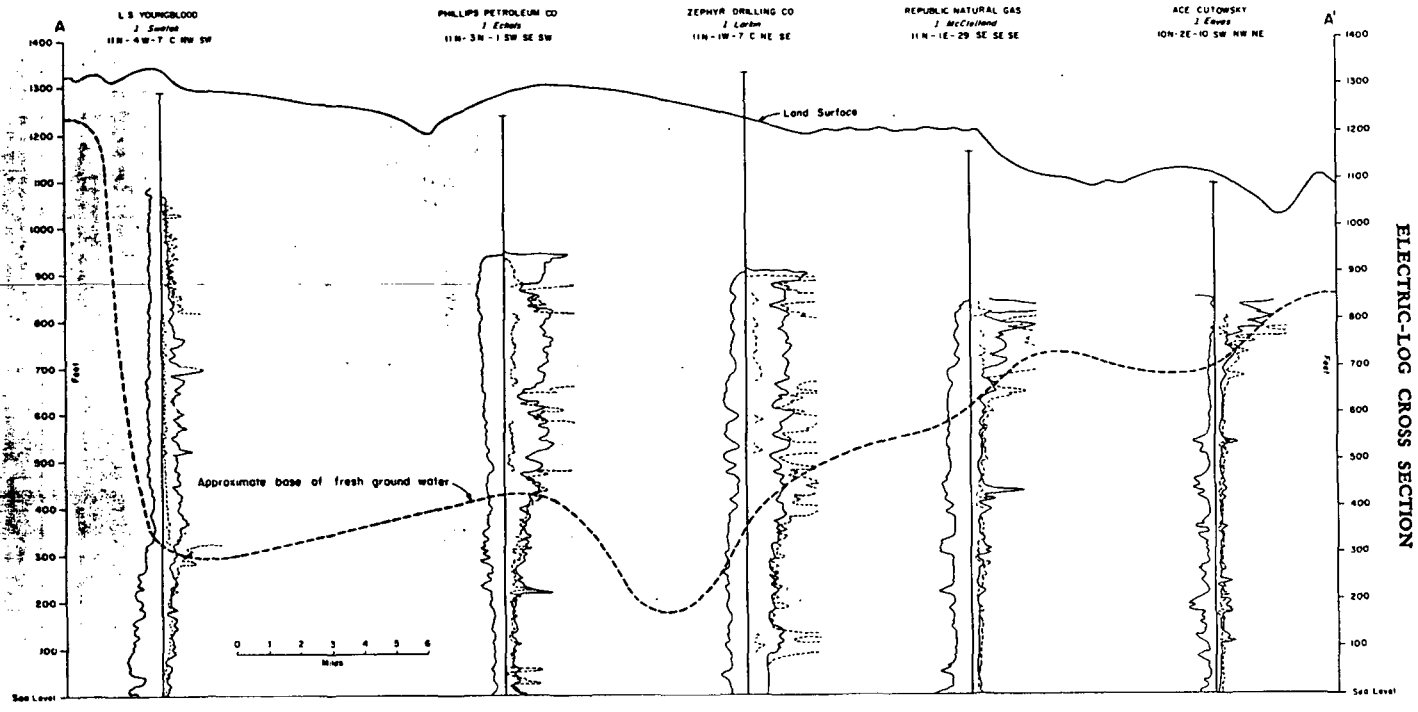


Figure 5. Electric-log cross section A-A' showing the approximate contact between fresh and salt water in Oklahoma County. The section is projected to a west-east line through the center of T. 11 N., as shown in figure 4, and not well-to-well, as shown on plate I.

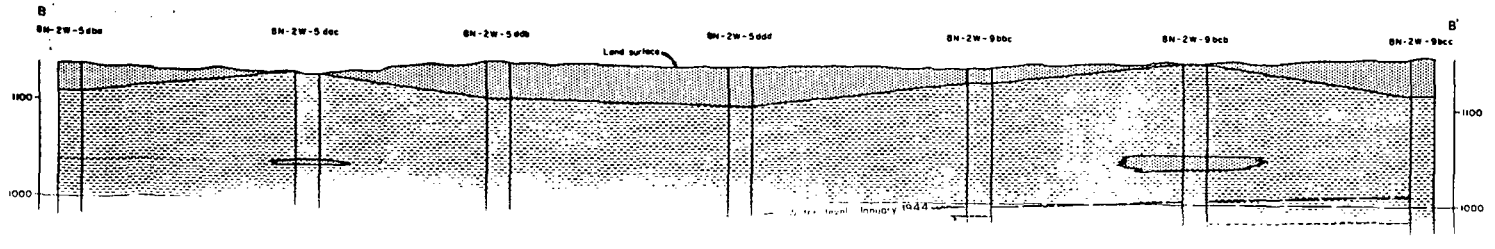


Figure 5. Electric-log cross section A-A' showing the approximate contact between fresh and salt water in Oklahoma County. The section is projected to a west-east line through the center of T. 11 N., as shown in figure 4, and not well-to-well, as shown on plate I.

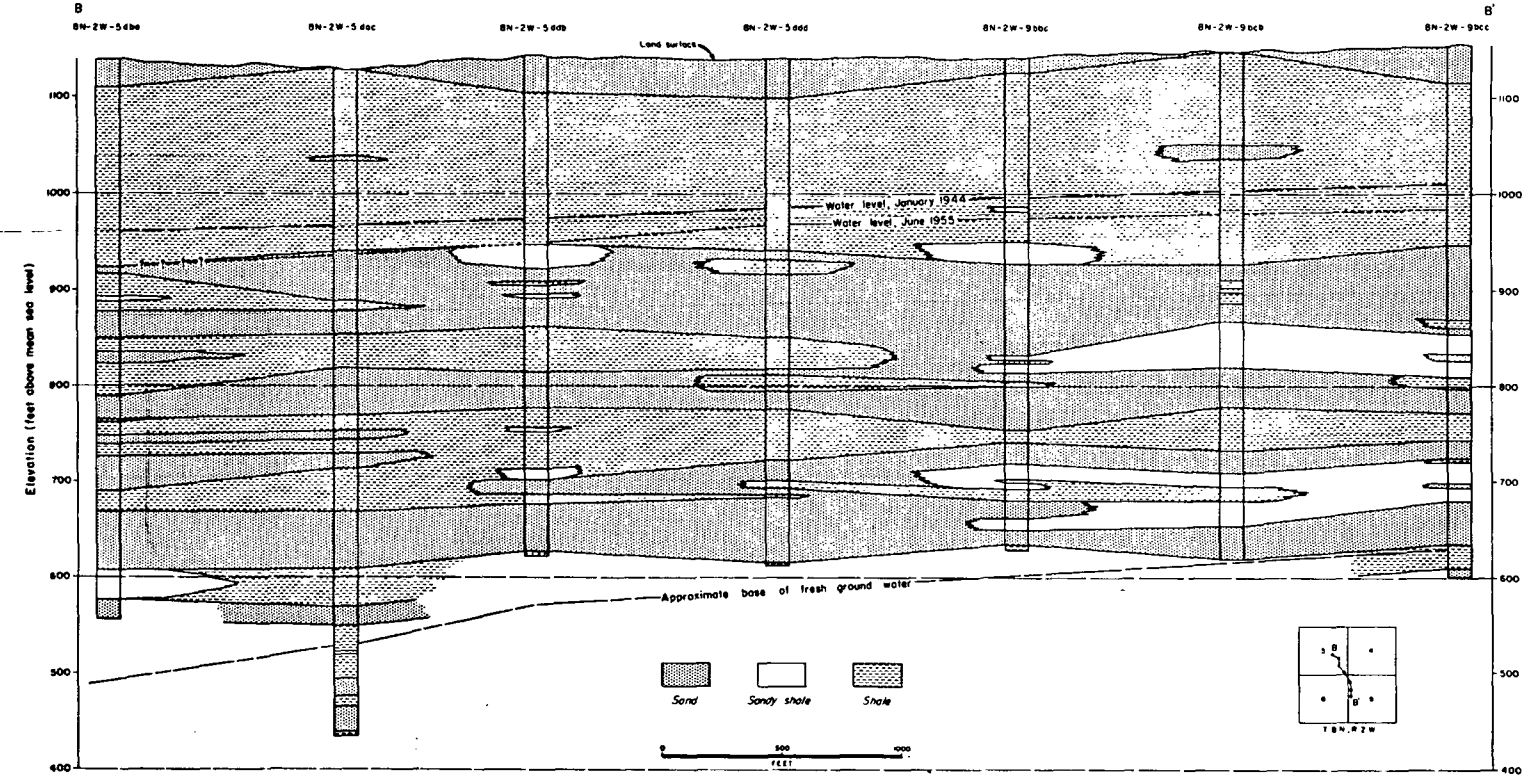


Figure 6. Well-log section B-B' showing the lenticular character of the Garber Sandstone and Wellington Formation in the Norman area, Cleveland County.

Reference 3

RECORD OF COMMUNICATION

TYPE: Phone Call **DATE:** 8/8/90 **TIME:** 1500

TO: Pat Hestand
Oklahoma Water Resources
Board
Bethany, Oklahoma
405/271-2505

FROM: Don L. Hudnall DLH
FIT Toxicologist
ICF Technology, Inc.
214/744-1641

SUBJECT: Information on Surface Water Usage for Lake Overholser

SUMMARY OF COMMUNICATION

Pat Hestand said that Lake Overholser serves as a water supply. She also said there is boating and fishing on the lake but that there is no swimming.

Reference 4

USER ID	ENTITY/APPLICANT NAME / PERMIT	SOURCE	COUNTY	ADDRESS / STR-SYS	USE	CITY / AMOUNT	ST ZIP / FACILITY	COUNTY OF USE	PERMITS GW SW
005216	(b) (6)			(b) (6)		OKLAHOMA CITY	OK 73116	OKLAHOMA	0 1
	320043	SURFACE	OKLAHOMA	2070	REC, FISH & WILDLIFE	23.0			
003014	(b) (6)			(b) (6)		CLINTON	OK 73601	CUSTER	1 0
	460011	GROUND	CUSTER	1083	IRRIGATION	28.0			
003223	(b) (6)			(b) (6)		OKLAHOMA CITY	OK 73119	ROGER MILLS	1 0
	820594	GROUND	ROGER MILLS	1084	IRRIGATION	230.0			
					MINING	10.0			
006627	(b) (6)			(b) (6)		TEXHOMA	OK 73949	TEXAS	1 0
	650535	GROUND	TEXAS	2054	IRRIGATION	267.0			
003377	(b) (6)			(b) (6)		CHEYENNE	OK 73628	ROGER MILLS	1 0
	820662	GROUND	ROGER MILLS	1152	IRRIGATION	230.0			
					MINING	10.0			
007753	(b) (6)			(b) (6)		TEXHOMA	OK 73949	TEXAS	1 0
	820506	GROUND	TEXAS	2054	IRRIGATION	1280.0			
009504	BESCO PRODUCTS, INC			P O BOX 368		ROFF	OK 74865	PONTOTOC	1 0
	880573	GROUND	PONTOTOC	1081	MINING	.3			
001027	(b) (6) TRUST			(b) (6)		AURORA	CO 80014	TEXAS	2 0
	6501948	GROUND	TEXAS	2054	IRRIGATION	237.0			
	6800578	GROUND	TEXAS	2054	IRRIGATION	249.0			
002272	(b) (6)			(b) (6)		CRESCENT	OK 73028	LOGAN	1 0
	720533	GROUND	LOGAN	2091	IRRIGATION	300.0			
006969	(b) (6)			(b) (6)		WAKITA	OK 73771	GRANT	1 0
	560744	GROUND	GRANT	2100	IRRIGATION	160.0			
009540	(b) (6)			(b) (6)		SPRINGDALE	AR 72764	DELAWARE	1 0
	890568	GROUND	DELAWARE	2060	AGRICULTURE	20.0			
007286	(b) (6)			(b) (6)		GOTEBO	OK 73041	WASHITA	0 1
	550136	SURFACE	WASHITA	1083	IRRIGATION	60.0			
005125	BETHANY, CITY OF			BOX 219		BETHANY	OK 73008	OKLAHOMA	3 0
	C/O (b) (6)								
	500004	GROUND	OKLAHOMA	2052	PUBLIC WATER SUPPLY	1980.0			
	730010	GROUND	OKLAHOMA	2052	PUBLIC WATER SUPPLY	1145.0			
	740241	GROUND	OKLAHOMA	2052	PUBLIC WATER SUPPLY	4446.0			
002500	BETTS FARMS INC			P O BOX 3		KEYES	OK 73947	CIMARRON	4 0
	C/O (b) (6)								
	590255	GROUND	CIMARRON	2054	IRRIGATION	310.0			

* INDICATES RECENT CHANGE OF OWNERSHIP - NO FEE RECEIVED

USER ID	ENTITY/APPLICANT NAME	ADDRESS	CITY	ST	ZIP	COUNTY OF USE	PERMITS GW	PERMITS SW
	PERMIT	SOURCE	COUNTY	STR-SYS	USE	AMOUNT	FACILITY	
002206	OKLA UNITED METHODIST CHURCH CAMPS	2420 NORTH BLACKWELDER	OKLAHOMA CITY	OK	73106	CHEROKEE	0	1
	560896	SURFACE	CHEROKEE	2170	REC, FISH & WILDLIFE	22.0		
000183	OKLAHOMA CITY GOLF & COUNTRY CLUB	2201 NW 63 ST	OKLAHOMA CITY	OK	73116	OKLAHOMA	2	1
	C/O [redacted]							
	530835	GROUND	OKLAHOMA	2092	IRRIGATION	123.0		
	820007	SURFACE	OKLAHOMA	2070	IRRIGATION	150.0		
	820507	GROUND	OKLAHOMA	2051	IRRIGATION	266.0		
					REC, FISH & WILDLIFE	54.0		
005178	OKLAHOMA CITY, CITY OF	[redacted]	OKLAHOMA CITY	OK	73102	OKLAHOMA	7	6
	C/O [redacted]							
	390055	SURFACE	OKLAHOMA	2052	PUBLIC WATER SUPPLY	80000.0	N. Canadian/Kaw Lk	
					INDUSTRIAL	.0		
	530409	GROUND	OKLAHOMA	2092	PUBLIC WATER SUPPLY	20.0		
	540613	SURFACE	ATOKA	1040	PUBLIC WATER SUPPLY	31367.0		
					INDUSTRIAL	.0		
	541259	GROUND	OKLAHOMA	2051	PUBLIC WATER SUPPLY	87.0		
	550506	GROUND	OKLAHOMA	2051	PUBLIC WATER SUPPLY	171.0		
	560952	GROUND	OKLAHOMA	2070	PUBLIC WATER SUPPLY	74.0		
	570328	SURFACE	OKLAHOMA	2092	REC, FISH & WILDLIFE	30.0		
	610170	GROUND	OKLAHOMA	2051	PUBLIC WATER SUPPLY	18.0		
	650167B	GROUND	OKLAHOMA	2051	IRRIGATION	26.0		
	730282D	SURFACE	OKLAHOMA	1040	PUBLIC WATER SUPPLY	40000.0	McGee Creek	
					INDUSTRIAL	.0		
	770595	GROUND	OKLAHOMA	2051	COMMERCIAL	640.0		
	800048	SURFACE	ATOKA	1040	PUBLIC WATER SUPPLY	60300.0		
	820119	SURFACE	OKLAHOMA	2052	PUBLIC WATER SUPPLY	28000.0	Overlay	
005208	OKLAHOMA COUNTY WATER CO	8613 NORTH GEORGIA	OKLAHOMA CITY	OK	73114	OKLAHOMA	2	0
	640232	GROUND	OKLAHOMA	2051	PUBLIC WATER SUPPLY	242.0		
	640233	GROUND	OKLAHOMA	2051	PUBLIC WATER SUPPLY	242.0		
003617	OKLAHOMA GAS & ELECTRIC COMPANY	P O BOX 321	OKLAHOMA CITY	OK	73101	PAWNEE	0	2
	730235	SURFACE	PAWNEE	2120	POWER	73000.0	SOONER STATION	
	730440	SURFACE	PAWNEE	2120	POWER	3600.0	SOONER STATION	
103617	OKLAHOMA GAS & ELECTRIC COMPANY	P O BOX 321	OKLAHOMA CITY	OK	73101	SEMINOLE	3	3
	670592	SURFACE	SEMINOLE	2061	POWER	27000.0	SEMINOLE STATION	
	670593	SURFACE	SEMINOLE	2061	POWER	8000.0	SEMINOLE STATION	
	690010	GROUND	SEMINOLE	2061	POWER	90.0	SEMINOLE STATION	
	690369	SURFACE	ATOKA	1040	POWER	285.0	SEMINOLE STATION	
	690410	GROUND	PONTOTOC	2061	POWER	2600.0	SEMINOLE STATION	
	860603	GROUND	SEMINOLE	2061	INDUSTRIAL	330.0	SEMINOLE STATION	
203617	OKLAHOMA GAS & ELECTRIC COMPANY	P O BOX 321	OKLAHOMA CITY	OK	73101	OKLAHOMA	2	2
	390062	SURFACE	OKLAHOMA	2051	POWER	7304.0	HORSESHOE LAKE STATION	
					INDUSTRIAL	.0		
	490131	GROUND	OKLAHOMA	2051	POWER	550.0	HORSESHOE LAKE STATION	

* INDICATES RECENT CHANGE OF OWNERSHIP - NO FEE RECEIVED

Reference 5

RECORD OF COMMUNICATION

TYPE: Phone Call **DATE:** 8/9/90 **TIME:** 936

TO: Paula Parker
Chamber of Commerce
Bethany, Oklahoma
405/789-1256

FROM: Don L. Hudnall DLH
FIT Toxicologist
ICF Technology
214/744-1641

SUBJECT: Population of Bethany, Oklahoma

SUMMARY OF COMMUNICATION

Upon communication with paula Parker, she informed me that approximately 23,000 people live in Bethany, Oklahoma.

Reference 6

Federal Emergency Management Agency
Federal Insurance Administration
Communities Participating in the National Flood Insurance Program

AS OF MAR 01, 1986

OKLAHOMA

Community Number	Community Name		Date of Entry Emergency or Regular Prog.	Date of Current Effective Map (or Map Index)
400173#	ADA, CITY OF	PONTOTOC COUNTY	JUL 16, 1980(R)	JUL 16, 1980
400155A	AFTON, TOWN OF	OTTAWA COUNTY	JAN 03, 1986(R) M	JAN 03, 1986
400063#	ALEX, TOWN OF	GRADY COUNTY	FEB 02, 1983(R)	FEB 02, 1983
4002588	ALINE, TOWN OF	ALFALFA COUNTY	OCT 15, 1985(R) M	OCT 15, 1985
400174#	ALLEN, TOWN OF	PONTOTOC COUNTY	NOV 30, 1982(R) M	NOV 30, 1982
400072#	ALTUS, CITY OF	JACKSON COUNTY	JUL 02, 1980(R)	JUL 02, 1980
400341	ALVA, CITY OF	WOODS COUNTY	MAR 30, 1979(R)	(NSFHA)
400018#	ANADARKO, CITY OF	CADDO COUNTY	SEP 17, 1980(R)	AUG 01, 1983
400182 B	ANTLERS, TOWN OF	PUSHMATAHA COUNTY	MAR 01, 1986(R) L	MAR 01, 1986
4000198	APACHE, CITYOF	CADDO COUNTY	MAY 15, 1985(R) M	MAY 15, 1985
400342	ARAPAHO, TOWN OF	CUSTER COUNTY	APR 15, 1982(R)	(NSFHA)
400031#	ARDMORE, CITY OF	CARTER COUNTY	JAN 06, 1982(R)	JAN 06, 1982
400343#	ARKOMA, TOWN OF	LE FLORE COUNTY	APR 19, 1983(R) M	APR 19, 1983
400008#	ATOKA, CITY OF	ATOKA COUNTY	JUL 20, 1982(R) M	JUL 20, 1982
400147#	AVANT, TOWN OF	OSAGE COUNTY	JUL 16, 1980(R)	JUL 16, 1980
400148#	BARNSDALL, CITY OF	OSAGE COUNTY	JUL 16, 1980(R)	JUL 16, 1980
400220#	BARTLESVILLE, CITY OF	WASHINGTON COUNTY	JUL 16, 1980(R)	JUL 16, 1980
		OSAGE COUNTY		
400009A	BEAVER, TOWN OF	BEAVER COUNTY	JUL 03, 1975	APR 09, 1976
400345#	BEGGS, CITY OF	OKMULGEE COUNTY	SEP 19, 1978(R) M	DEC 29, 1981
400260A	BENNINGTON, TOWN OF	BRYAN COUNTY	AUG 19, 1985(R) M	AUG 19, 1985
400261A	BESSIE, TOWN OF	WASHITA COUNTY	MAY 01, 1985(R) M	MAY 01, 1985
400254	BETHANY, CITY OF	OKLAHOMA COUNTY	JUL 31, 1979(R)	(NSFHA)
400347A	BILLINGS, TOWN OF	NOBLE COUNTY	JUN 19, 1985(R) M	JUN 19, 1985
400020A	BINGER, TOWN OF	CADDO COUNTY	SEP 16, 1975	JAN 16, 1976
400207#	BIXBY, TOWN OF	TULSA COUNTY	SEP 28, 1979(R)	SEP 28, 1979
400078#	BLACKWELL, CITY OF	KAY COUNTY	MAY 01, 1980(R)	MAY 01, 1980
400348#	BLAIR, TOWN OF	JACKSON COUNTY	AUG 03, 1982(R) M	AUG 03, 1982
400101#	BLANCHARD, CITY OF	MCCLAIN COUNTY	JAN 03, 1986(R) M	JAN 03, 1986
400262A	BLUEJACKET, TOWN OF	CRAIG COUNTY	OCT 24, 1978(R) M	OCT 24, 1978
4000428	BOISE CITY, CITY OF	CIMARRON COUNTY	NOV 01, 1985(R) M	NOV 01, 1985
400349A	BOKCHITO, TOWN OF	BRYAN COUNTY	OCT 19, 1982(R) M	OCT 19, 1982
400350A	BOKOSHE, TOWN OF	LE FLORE COUNTY	APR 17, 1979(R) M	APR 17, 1979
400138A	BOLEY, TOWN OF	OKFUSKEE COUNTY	FEB 13, 1976	JAN 23, 1976
400468#	BOWLEGS, TOWN OF	SEMINOLE COUNTY	AUG 19, 1985(R) M	AUG 19, 1985
400120#	BOYNTON, TOWN OF	MUSKOGEE COUNTY	SEP 28, 1979(R)	SEP 28, 1979
400121	BRAGGS, TOWN OF	MUSKOGEE COUNTY	MAY 25, 1978(R)	(NSFHA)
400051#	BRISTOW, CITY OF	CREEK COUNTY	MAY 04, 1982(R) M	MAY 04, 1982
400236#	BROKEN ARROW, CITY OF	TULSA COUNTY	AUG 17, 1981(R)	SEP 05, 1984
		WAGONER COUNTY		
4001078	BROKEN BOW, CITY OF	MCCURTAIN COUNTY	MAY 20, 1975	NOV 15, 1985
4004698	BROOKSVILLE, CITY OF	POTTAWATOMIE COUNTY	AUG 19, 1985(R) M	AUG 19, 1985
400482A	BRYAN COUNTY *	BRYAN COUNTY	JUL 21, 1982	DEC 06, 1977
400351A	BUFFALO, TOWN OF	HARPER COUNTY	AUG 25, 1976	DEC 03, 1976
400005	BURLINGTON, TOWN OF	ALFALFA COUNTY	JUL 25, 1975	AUG 23, 1974
400266A	BUTLER, TOWN OF	CUSTER COUNTY	MAY 15, 1985(R) M	MAY 15, 1985
400267A	BYARS,TOWN OF	MCCLAIN COUNTY	JUN 05, 1985(R) M	JUN 05, 1985
400048A	CACHE, TOWN OF	COMANCHE COUNTY	MAR 10, 1975	JUL 30, 1976
400353	CADDO, TOWN OF	BRYAN COUNTY	MAY 25, 1978(R)	(NSFHA)
400354	CALERA, TOWN OF	BRYAN COUNTY	MAR 14, 1978	AUG 13, 1976
400269	CALVIN, TOWN OF	HUGHES COUNTY	SEP 07, 1976	SEP 19, 1975
400271#	CAMERON,TOWN OF	LE FLORE COUNTY	APR 19, 1983(R) M	APR 19, 1983
400485#	CANADIAN COUNTY *	CANADIAN COUNTY	FEB 11, 1985	JAN 03, 1986
400272A	CANADIAN, TOWN OF	PITTSBURG COUNTY	MAY 15, 1985(R) M	MAY 15, 1985
400012B	CANTON, TOWN OF	BLAINE COUNTY	MAY 15, 1985(R) M	MAY 15, 1985
400274	CANUTE, TOWN OF	WASHITA COUNTY	JUN 03, 1984(R)	(NSFHA)
400021#	CARNEGIE, TOWN OF	CADDO COUNTY	JUL 20, 1982(R) M	JUL 20, 1982
400276A	CARTER, TOWN OF	BECKHAM COUNTY	MAY 15, 1985(R) M	MAY 15, 1985
400185#	CATOOSA, CITY OF	ROGERS COUNTY	AUG 01, 1980(R)	AUG 01, 1980
400237	CHANDLER, CITY OF	LINCOLN COUNTY	APR 18, 1975	AUG 13, 1976
400238A	CHECOTAH, CITY OF	MCINTOSH COUNTY	JUN 19, 1985(R) M	JUN 19, 1985
400006#	CHEROKEE, CITY OF	ALFALFA COUNTY	DEC 02, 1980(R)	JAN 19, 1982
4001838	CHEYENNE, TOWN OF	ROGER MILLS COUNTY	AUG 05, 1985(R) M	AUG 05, 1985
400234#	CHICKASHA, CITY OF	GRADY COUNTY	SEP 30, 1980(R)	SEP 30, 1980
400357#	CHOCTAW, CITY OF	OKLAHOMA COUNTY	APR 15, 1981(R)	APR 15, 1981
400115	CHOUTEAU, TOWN OF	MAYES COUNTY	JAN 26, 1983(R)	(NSFHA)
405375#	CLAREMORE, CITY OF	ROGERS COUNTY	AUG 27, 1971(R)	JAN 19, 1982
400358A	CLAYTON, TOWN OF	PUSHMATAHA COUNTY	MAY 01, 1985(R) M	MAY 01, 1985
400280B	CLEO SPRINGS, TOWN OF	MAJOR COUNTY	JUN 05, 1985(R) M	JUN 05, 1985
400162	CLEVELAND, CITY OF	PAWNEE COUNTY	APR 15, 1982(R)	(NSFHA)
400054#	CLINTON, CITY OF	CUSTER COUNTY	JUL 02, 1980(R)	JUL 02, 1980
400510	COAL COUNTY	COAL COUNTY	MAR 29, 1982	
400047B	COALGATE, CITY OF	COAL COUNTY	AUG 08, 1978(R) M	AUG 08, 1978
400359	COLBERT, TOWN OF	BRYAN COUNTY	OCT 26, 1977	APR 09, 1976
400360#	COLLINSVILLE, CITY OF	TULSA COUNTY	JUL 02, 1981(R)	JUL 02, 1981
400253#	COLONY, TOWN OF	WASHITA COUNTY	SEP 10, 1984(R)	FEB 16, 1983
405376C	COMANCHE, CITY OF	STEPHENS COUNTY	DEC 23, 1971(R)	SEP 26, 1975
400156A	COMMERCE, CITY OF	OTTAWA COUNTY	JUL 18, 1985(R) M	JUL 18, 1985
400361A	COPAN, TOWN OF	WASHINGTON COUNTY	JUL 26, 1977(R) M	JUL 26, 1977
400362A	COVINGTON, TOWN OF	GARFIELD COUNTY	MAY 01, 1985(R)	MAY 01, 1985
400216	COWETA, CITY OF	WAGONER COUNTY	MAR 21, 1978	JUN 04, 1976
400097	COYLE, TOWN OF	LOGAN COUNTY	JUN 07, 1985	AUG 13, 1976
400490#	CREEK COUNTY *	CREEK COUNTY	MAY 06, 1985	MAY 19, 1981

National Flood Insurance
Program Community Status Book

Federal Emergency Management Agency
Federal Insurance Administration
Washington, D.C. 20472

OKLAHOMA

Purpose

This book provides information about:

- communities participating in the National Flood Insurance Program (42 U.S.C. 4001-4128) - *Section I.*
- communities which are not participating in the National Flood Insurance Program but have had special flood hazards identified by the Federal Insurance Administration - *Section II.*

Its purpose is to:

- assist lenders in determining whether or not flood insurance must be required as a condition of Federal or federally-related financial assistance.
- assist property owners and insurance agents in determining whether or not flood insurance is available in a particular community, and whether a map showing flood zones is available.
- assist Federal agencies in meeting their responsibilities under Executive Order 11988 (42 FR 26951) to evaluate whether a proposed action will occur in a flood hazard area.
- assist State and local agencies by providing information for flood plain management.
- assist any other members of the general public who may be interested in the information contained within this book.

Section I

Section I of this book lists communities *PARTICIPATING* in the National Flood Insurance Program. Flood insurance policies for residential and commercial properties and their contents located in the communities listed may be purchased from any insurance agent or broker licensed to sell property or casualty insurance and in good standing in all the states in which the agent is licensed. Agents may obtain information about coverage, rates, etc., by calling the National Flood Insurance Program (800) 638-6620 (toll free), or in the Washington, D.C. metropolitan area 897-5900 or in Maryland (800) 492-6605.

Column 1 - (COMMUNITY NUMBERS). These six digit numbers are either the same number or the same first six digits of the community number (or COMMUNITY PANEL NUMBER) appearing on the FIA flood map for the community. The alphabetic suffix at the end of the number indicates whether the currently effective map is a revision of an earlier map (e.g., "A" normally indicates a first edition, "B" a first revision, etc.) This number and the suffix, if any, must be written on all flood insurance policies.

Column 2 - (COMMUNITY NAME). This indicates the name of the community, followed by the name of the country in which it is located. When the community is a county, only its unincorporated areas are referred to; incorporated areas are listed individually as township, city, village, etc.

Column 3 - This indicates THE DATE OF THE COMMUNITY'S ENTRY INTO THE REGULAR OR EMERGENCY PROGRAM, of the National Flood Insurance Program. The symbol (R) following the date indicates Regular Program; if no parenthetical symbol appears after the date, the community is participating in the Emergency Program.

Column 4 - This indicates THE EFFECTIVE DATE OF THE CURRENTLY EFFECTIVE FLOOD MAP OF THE COMMUNITY. This date also appears on the flood map of the community. If there is no date in this column, a flood map for the community has not yet been published, but the community is still participating in the National Flood Insurance Program.

NOTE: If a date appears in both columns, then the purchase of flood insurance is required as a condition of Federal or federally-related financial assistance for construction or acquisition of buildings (including FHA and VA mortgage guarantees, mortgage loans from federally regulated lending institutions, Federal disaster assistance etc.) located within the special flood hazard areas as shown on the FIA flood maps.

Section II

Section II of this book lists communities which are *NOT PARTICIPATING* in the National Flood Insurance Program, but which have an FIA flood map delineating the special flood hazard areas in the community.

Column 1 - same as Column 1 described above.

Column 2 - same as Column 2 described above.

Column 3- HAZARD AREA IDENTIFIED. This is the date of the *first* FIA flood map of that community. There may be other, more recent maps for the community.

Column 4 - DATE ON WHICH SANCTIONS APPLY. Effective on this date, no direct Federal assistance (including FHA or VA mortgage guarantees) can legally be provided for the acquisition or construction of buildings in the special flood hazard areas shown on

the FIA map of this community. If this date will pass before the next publication of this book, the symbol (P) will appear next to the date in Column 4. To obtain up-to-date information on whether the sanction on Federal assistance still applies for their community, call the Federal Emergency Management Agency (202) 646-3444

Symbols

NSFHA - The community has *no special flood hazard areas* and a flood map for the community has not been published. Although it may not be subject to the 100-year flood, floods of a greater magnitude could occur there. In addition, certain structures may be damaged by local drainage problems.

L - Minimally Flood Prone, with Flood Hazard Boundary Map converted to Flood Insurance Rate Map by letter, no change in flooding shown on map, no elevation on map.

M - Minimally Flood Prone, no elevation on map.

P - Participation deadline will pass before the next publication of the Status Book. Call the above number for up-to-date information after the deadline date.

R - Entry date into Regular Program.

S - Suspended from the National Flood Insurance Program. No flood insurance available. Other sanctions apply. For up-to-date information after suspension date, call the above number.

F - Effective Map is a Flood Insurance Rate Map. Note, however, that the "Hazard Area Identified" date denotes the date of original identification of the special flood hazard area and is not necessarily the date of the most recent Flood Insurance Rate Map.

W - The community has withdrawn from the National Insurance Program. (Subject to restrictions on lending if community is not in the Program by one year after their initial hazard ID date).

★ - Unincorporated areas only.

- This community has a map with a *10-digit ID number.* Each map with such a number will be published as one or more Z-fold panels (like road maps). Each map having more than one panel also has an index showing which panels apply to the various sections of a community. Since the 10-digit system permits the revision of individual panels rather than the entire map, the index also shows the correct suffix of the most current panel for a particular location in the community.

Each time a panel is revised and published, the map index is also revised and republished with a new effective date to reflect the panel revision. For community maps with 10-digit ID numbers, the Status Book gives data relating to the index only. The index must be consulted for information on individual panels.

State-Owned Property

Flood insurance is not required for *State-owned property* in the following states because the states have submitted to FIA satisfactory self-insurance plans against flood loss:

Florida	North Carolina
Georgia	Oklahoma
Iowa	Oregon
Maine	South Carolina
New York	Tennessee
New Jersey	Vermont

Publication Schedules

This book is published semiannually and is available in separately-bound copies for each state, or, if nationwide information is needed, in a bound copy for the entire Nation. Copies are free; to get on the distribution list or change your address, number of copies ordered, etc., call 202-646-2789. To report errors found in this book, call (800) 638-7418, (toll free), (800) 492-1676 (toll free) in Maryland only.

Updates to this book are published periodically in the *Federal Register*, which is determinative for the purpose of corrections and legal effect.

Ordering Flood Maps

FIA flood maps and/or indices may be ordered from:

Federal Emergency Management Agency
Flood Map Distribution Center
6930 (A-F) San Tomas Road
Baltimore, Maryland 21227-6227 or call
National Flood Insurance Program
Telephone: (800) 638-6620 (toll free)
(800) 492-6605 (toll free) in Maryland only

Reference 7

U.S. DEPARTMENT OF COMMERCE
LUTHER H. HODGES, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture

NOTICE
Rainfall-frequency information for durations of 1 hour and less for the Central and Eastern States has been superseded by NOAA Technical Memorandum NWS HYDRO-35 Five to Sixty-Minute Precipitation Frequency for the Eastern and Central United States. This publication (Accession No. PB 272-112/AS) is obtainable from:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

THIS ATLAS IS OBSOLETE FOR THE FOLLOWING 11 WESTERN STATES: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

NOAA ATLAS 2: PRECIPITATION-FREQUENCY ATLAS OF THE WESTERN UNITED STATES (GPO: 11 Vols., 1973) supersedes the Technical Paper 40 data for these states.

All but 3 of the 11 state volumes are out of print, and no reprint is presently planned.

Institutions in the eleven western states likely to have copies of these volumes for their state for public inspection are:

US Department of Agriculture Soil Conservation Service Offices
US Army Corps of Engineers Offices
Selected University Libraries
National Weather Service Offices (may also have volumes for adjacent states).
National Weather Service Forecast Offices (may have all eleven volumes)

Elsewhere, libraries of universities where hydrology and meteorology degree programs are offered may shelve some of the eleven volumes.

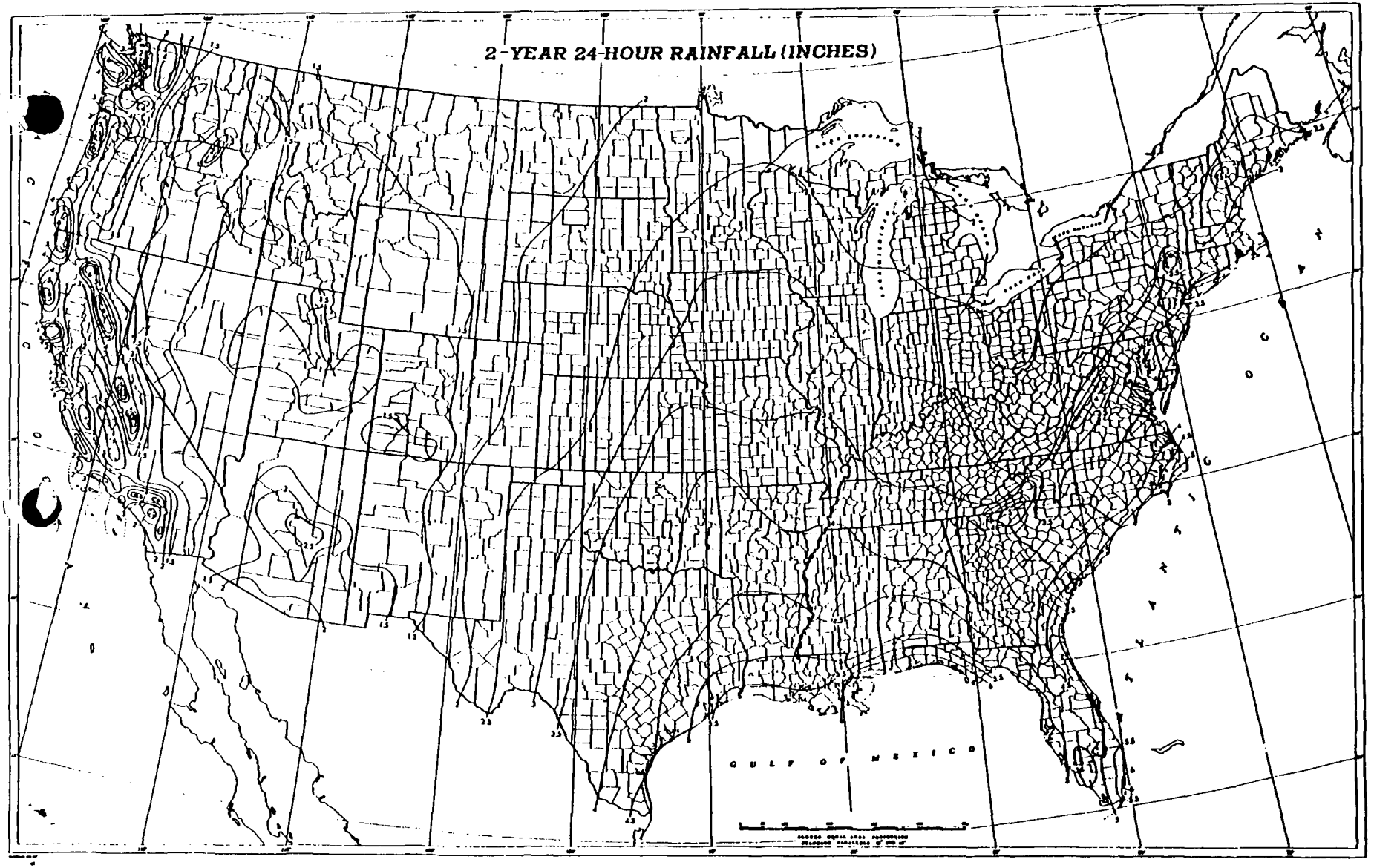
The three volumes in print as of 1 Jan 1983 at the GPO are:

Vol	State	GPO Stock Number	Price
IV	New Mexico	003-017-00158-0	$10.00
VI	Utah	003-017-00160-1	12.00
VII	Nevada	003-017-00161-0	9.50

The GPO order number is 202-783-3238 for VISA and MASTERCARD orders which

8011

WASHINGTON, D.C.
May 1961


2-YEAR 24-HOUR RAINFALL (INCHES)
GULF OF MEXICO

Reference 8

RECORD OF COMMUNICATION

TYPE: Phone Call **DATE:** 8/15/90 **TIME:** 1320

TO: John Skeen
Oklahoma Department of
Wildlife
405/521-4619

FROM: Don L. Hudnall DLH
FIT Toxicologist
ICF Technology, Inc.
214/744-1641

SUBJECT: Endangered Species in the Stinchcomb Wildlife Refuge

SUMMARY OF COMMUNICATION

Mr. Skeen informed me that the Interior Lease Tern (a shore bird) is recorded in the Rose Lake area near the refuge. He also mentioned that the Bald Eagle and the Whooping Crane occasionally visit the area but that those visits are sporadic.

Reference 9

CLIMATIC ATLAS OF THE UNITED STATES

U.S. DEPARTMENT OF COMMERCE

Environmental Data Service

NORMAL ANNUAL TOTAL PRECIPITATION (Inches)